

Potential Conflicts between Agricultural Trade Rules and Climate Change Treaty Commitments

Christian Häberli*

Table of Contents

Abstract	2
1. Introduction	5
2. A 'Climate Change Tool Box' for Agriculture	7
3. WTO Rules and Case Law Relevant for Climate Action.....	9
1 Basic WTO Non-Discrimination Trade Rules	9
2 Specific Rules for Agricultural Trade possibly applying to Climate Measures	11
3 Exceptions, Interpretations, Amendments and Waivers	13
4 Addressing Development Concerns	21
5 Climate Provisions in Regional Agreements	22
4. A Preliminary Legal Analysis.....	23
1 Border Measures	24
2 Tax My Footprint?	26
3 Subsidies.....	27
4 Consumer Information	28
5 Risk Management, Risk Insurance and Climate Change Adaptation.....	30
5. Conclusions: Act Carefully but Rapidly.....	33
Literature	41

* PhD (Law) and Fellow at the World Trade Institute (Bern University, Switzerland). This Working Paper has been commissioned by FAO and is to be published as an Annex to the State of Agricultural Commodities Report (2018). All comments welcome. All errors and omissions are my own responsibility.

Abstract

Climate change – among its many other challenges – also impacts on conditions of competition along the whole food value chain. This article posits that many mitigation and adaptation policies imply a differentiation between otherwise identical products with different climate footprints. Where imports are affected, there is a potential for trade frictions. The main issue appears to be a climate-smart treatment of so-called ‘non-product-related like products.’ Now that national governments start implementing their commitments under the Paris Agreement on Climate Change, they have to closely look at the trade and investment impact of their Nationally Determined Contributions (NDC). The NDC presently available remain silent on concrete measures involving product differentiation according to footprint differences, by way of border adjustment measures, subsidies, prohibitions, or restrictions. The non-discrimination principle enshrined in the multilateral trading system can be a problem for such differentiations. No climate-smart agricultural measures have as yet been notified to the WTO. But several renewable energy programmes have been found to violate WTO rules. Potential problems could arise, for instance, from differentiating tariffs, import restrictions or taxes according to climate footprint. Conditions of competition might even be affected by labels signalling products with a bigger footprint, or through subsidies and incentives compensating domestic producers subject to emissions reductions, prohibitions, and input restrictions. A second major problem lies in the way the Paris Agreement and the WTO address the Development Dimension. In the Paris Agreement the Development Dimension is addressed by the notion of Common but Differentiated Responsibility (CBDR), leaving basically all Parties free on how to take development into account in their NDC. On the other side, the so-called ‘Special and Differentiated Treatment’ (SDT) foreseen in all WTO agreements for developing country products and services appears incapable to deal with the global impact of all emissions, regardless of their origin, or with the negative impact on developing country exports to climate-smart markets in developed countries.

In conclusion we suggest that a review of the climate-relevant trade and investment rules is necessary at the international level, involving climate, agriculture and trade regulators, supported by scientific, economic and legal expertise. The purpose of this review is to avoid litigation jeopardising the implementation of the Paris Agreement. At the same time, such a review must be wide-ranging, because the objective is to ensure maximum policy space for climate mitigation and adaptation without negatively impacting on other countries, or unduly restricting trade and investment, especially in poor developing countries. Last but not least, this intergovernmental and inter-institutional review is urgent, because the results should provide as quickly as possible the legal security necessary for regulators, NDC developments and reviews, and international standard-setting processes.

List of Acronyms

AoA	Agreement on Agriculture (WTO)
ADP	Agreement on Implementation of Article VI (Antidumping)
AFOLU	Agriculture, Forestry, and Other Land Uses
BAM	Border Adjustment Measures (e.g. Border Tax Adjustments in WTO)
CBDR (CBDRRC)	Common but Differentiated Responsibilities (and Respective Capabilities)
CDM	Clean Development Mechanism
CER	Certified Emission Reduction (units)
COP	Conference of the Parties (UNFCCC)
DSU	Understanding on Rules and Procedures Governing the Settlement of Disputes
ETS	Emission Trading Schemes
FAO	Food and Agriculture Organization
FDI	Foreign Direct Investment
FTA	Free Trade Agreement
GATT	General Agreement on Tariffs and Trade 1994
GATS	General Agreement on Trade in Services 1994
GHG	Greenhouse Gases ¹
GIS	Green Investment Scheme
GPA	Agreement on Government Procurement
IET	International Emissions Trading
IPPC	Intergovernmental Panel on Climate Change
ISDS	Investor-State Dispute Settlement
LIC	Agreement on Import Licensing Procedures
MFN	Most-Favoured Nation Treatment
(INDC) NDC	(Initial) Nationally Determined Contributions
NFIDC	Decision on Measures Concerning the Possible Negative Effects of the Reform Programme on Least-Developed and Net Food-Importing Developing Countries
NGO	Non-Governmental Organisations
NT	National Treatment
NTM/NTB	Non-Tariff Measures/Barriers
ODA	Official Development Assistance
OECD	Organisation for Economic Cooperation and Development
OIE	Office International des Epizooties
PPM	Production and Processing Methods
PSI	Agreement on Preshipment Inspection
R&D	Research, (Extension) and Development
RoO	Agreement on Rules of Origin
RTA	Regional Trade Agreement
Safeg	Agreement on Safeguards
Schedules	Geneva (1995) Protocol to the General Agreement on Tariffs and Trade 1994
SCM	Agreement on Subsidies and Countervailing Measures
SDG	Sustainable Development Goals
SDT	Special and Differentiated Treatment
SPS	Agreement on Sanitary and Phytosanitary Measures
TBT	Agreement on Technical Barriers to Trade
TFA	Trade Facilitation Agreement
TRIMS	Agreement on Trade Related Aspects of Investment Measures

¹ Here comprising the following gases: Carbon dioxide (CO₂), Methane (CH₄), Nitrous oxide (N₂O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), Sulphur hexafluoride (SF₆), Nitrogen trifluoride (NF₃) (Source: Doha amendment to the Kyoto Protocol, December 2012, Article 1, Paragraph B)

TRIPS	Agreement on Trade-Related Aspects of Intellectual Property Rights
TFA	Agreement on Trade Facilitation (2014)
UNCTAD	United Nations Conference on Trade and Development
UNFCCC	United Nations Framework Convention on Climate Change
UNTS	United Nations Treaty Series
WHO	World Health Organization
WTO	World Trade Organization
WTO Agreement	Marrakesh Agreement Establishing the World Trade Organization
VAL	Agreement on Implementation of Article VII (Customs Valuation)
VCLT	Vienna Convention on the Law of Treaties

1. Introduction

On 12 December 2015 the world at large feted the successful conclusion of the Paris Agreement.² Yet, scarce attention was paid to the legal implications of the *Nationally Determined Contributions* (NDC) which each party is individually committed to submit, and progressively update, under Article 3 of this agreement.³ This lack of attention can be explained by the virtual absence of indications on how individual countries are to reduce their emissions of greenhouse gases (GHG).⁴ Negotiations had focused on the formulation of the 'top-down' commitment of all parties to address climate change, on the overall reduction targets, and on the technology and finance transfers required by developing countries. The 'bottom-up' obligations are basically to design NDC which will progressively mitigate global warming, and to account for delivery and performance.

The discretion enjoyed by all NDC under the Paris Agreement is greater than that of its predecessor agreements. As will be shown, this implementation freedom also applies to the way each party has to take into account the development dimension in the formulation of its NDC. The principle of *Common but Differentiated Responsibilities and Respective Capabilities* (CBDRRC) has been laid down in Article 2.2.⁵ In addition to the development concerns, numerous other objectives must also be considered such as the sustainability of development, human rights, health, migration and gender equality – again, without clearly formulated indications of the implementation modalities.⁶

Within these basic and complex commitments, at this stage the Paris Agreement offers nearly total latitude for implementation. For the time being, it completely lacks common standards, enforcement mechanisms, or sanctions for non-compliance. This was different for

² Paris Agreement under the United Nations Framework Convention on Climate Change (UNFCCC). UNTS 8 July 2016, Chapter XXVII-7-d, Registration Number 54113. Downloaded on 5 September 2017 at https://unfccc.int/paris_agreement/items/9485.php.

³ Article 3: As nationally determined contributions to the global response to climate change, all Parties are to undertake and communicate ambitious efforts [...] with the view to achieving the purpose of this Agreement as set out in Article 2. The efforts of all Parties will represent a progression over time, while recognizing the need to support developing country Parties for the effective implementation of this Agreement.

⁴ Article 4.13: Parties shall account for their nationally determined contributions. In accounting for anthropogenic emissions and removals corresponding to their nationally determined contributions, Parties shall promote environmental integrity, transparency, accuracy, completeness, comparability and consistency, and ensure the avoidance of double counting, in accordance with guidance adopted by the Conference of the Parties serving as the meeting of the Parties to this Agreement.

Article 4.14: In the context of their nationally determined contributions, when recognizing and implementing mitigation actions with respect to anthropogenic emissions and removals, Parties should take into account, as appropriate, existing methods and guidance under the Convention, in the light of the provisions of paragraph 13 of this Article.

⁵ 'This Agreement will be implemented to reflect equity and the principle of *common but differentiated responsibilities and respective capabilities*, in the light of different national circumstances.' (emphasis added)

⁶ For example, Preamble Indent 11 lists no less than a dozen concerns and objectives having to guide climate change action:

'Acknowledging that climate change is a common concern of humankind, Parties should, when taking action to address climate change, respect, promote and consider their respective obligations on human rights, the right to health, the rights of indigenous peoples, local communities, migrants, children, persons with disabilities and people in vulnerable situations and the right to development, as well as gender equality, empowerment of women and intergenerational equity.'

the UNFCCC predecessor agreement, the *Kyoto Protocol* (2007), which described in some detail both domestic and international *Joint Implementation* measures like the Emission Trading Schemes (ETS)⁷ and their joint mechanism International Emissions Trading (IET),⁸ the Clean Development Mechanism (CDM),⁹ the Green Investment Scheme (GIS),¹⁰ or the Border Adjustment Measures (BAM).¹¹ The Paris Agreement contains no implementation tools, and foresees no specific mechanisms for joint implementation such as ETS and CDM; it leaves the choice – and the responsibility to respect international trade and investment rules – to the parties.¹² The problem with this freedom to regulate under 'Paris' consists, as will be shown below, in the justification under international treaty law of WTO rules violations such as in GATT-Article XX (General Exceptions) and on the *Vienna Convention on the Law of Treaties* (VCLT).¹³

The Parties to the Paris Agreement do intend to work on standard-setting, including for agriculture. The October 2017 Decision at COP23 to 'address issues related to agriculture' can be seen as a first step for the commitment enshrined in the Agreement to 'progressively' improve NDC in five-year steps, and not to scale back existing commitments (UNFCCC/IPCC 2017). The monitoring mechanism built into this ratchet clause definitely lends some force to the review and improvement process.

The complexity of climate action is daunting, especially for agriculture. But this does not mitigate the basic commitment of all participating countries to take action, regardless of their level of development. The most relevant term for this article is *differentiation*. Climate expert Lavanya Rajamani has rightly noted that the Paris agreement

operationalizes the CBDRRC principle *not by tailoring commitments to categories of Parties* as the FCCC and the Kyoto Protocol do, but by *tailoring differentiation to the specificities of each of the Durban pillars* – mitigation, adaptation, finance, technology, capacity-building and transparency.¹⁴

In a trade perspective, while all countries and regions are affected by climate change, Paris signatories will have to formulate their NDC for each of these pillars and in line with their specific situation. In order to meet its contribution to the global warming limitation target, Singapore with less than one thousand heads of cattle will have other emission reduction priorities than Canada with one million dairy cows. Countries where agriculture has a large

⁷ Article 17 of the Kyoto Protocol to the UNFCCC specifically allows emissions trading where countries are committed to limitation and reduction of their emissions under Article 3 of that agreement.

⁸ IET was foreseen in the context of the European Union Emissions Trading Scheme (EU ETS) as a possibility for the implementation of national Kyoto obligations to occur between participating countries (Carbon Trust, 2009, p. 24)

⁹ The Clean Development Mechanism (CDM) is one of the *Flexible Mechanisms* defined in Article 12 of the Kyoto Protocol. It is the legal basis for emissions reduction projects generating Certified Emission Reduction units (CERs) which may be traded in ETS.

¹⁰ GIS was designed as a voluntary option for trading surplus allowances (AAUs) under the Kyoto Protocol, thereby achieving additional environmental benefits.

¹¹ For a good description of the various Kyoto Protocol-related instruments see Carbon Trust (2009, p. 20ss).

¹² As a first step, on 14 November 2017, the COP23 decided to launch a process of identification of 'issues relating to agriculture' (UNFCCC/IPCC 2017); cf. Section 5 *in fine*.

¹³ UNTS, vol. 1155, p. 331

¹⁴ Rajamani (2016) p.27 (emphasis added)

footprint, in relative or in absolute terms, can hardly avoid climate action in respect of their agricultural policies. What then does the Paris Agreement imply for the formulation of climate-smart agricultural reforms? What normative value will its broad commitments have for the formulation of NDC in view of political opportunities, financial, domestic and foreign investment and competition aspects? Can the absence of agreed mechanisms, and of production and processing standards, lead to a haphazard, chaotic implementation at the national level – without the legal security afforded under treaty law to measures complying with international standards? What normative value can vague standards such as 'implied' carbon content have? Is this just a matter of trade-impact-neutral promotion of food production with a reduced footprint?

This article tries to answer these questions at the interface between climate change mitigation and adaptation measures and trade rules. The hypothesis which will be developed here is that border measures and agricultural subsidies differentiating according to different product or process footprints may face WTO-compatibility problems, especially where they are not clearly based on mandatory international standards.

The interaction between Paris and WTO is analysed in the following order.

Section Two recalls the various national and international agricultural policy tools which can be used for climate change mitigation programmes. We list these measures in a 'Climate Change Agricultural Tool Box'. Section Three analyses these tools by describing the basic rules under WTO Law potentially applying to such measures in general, and specifically for agriculture. We also compare the development dimension as it is addressed under the Paris Agreement and in the WTO, respectively, and add a few considerations on Regional Trade Agreements. With this background, Section Four examines the main patterns described in recent literature, and emerging from the available INDC and NDC, in the light of the most relevant WTO rules and case law. This examination shows the potential conflicts of these measures in the light of the relevant general non-discrimination rules and non-specific commitments of the WTO, including existing or possibly required flexibilities, exceptions, exemptions, interpretations, amendments and waivers.

The conclusions in Section Five summarise the main problems potentially arising under relevant trade rules for the implementation of the Paris Agreement in the field of agriculture. We then propose an intergovernmental and horizontal review of these issues. Finally, we outline a number of possible solutions, avoiding litigation and securing non-trade distorting avenues.

2. A 'Climate Change Tool Box' for Agriculture

A very large number of different measures can be considered for the implementation of (more or less) climate-smart agricultural policies and practices, including new production and enhanced productivity technologies, science, education and extension, investment and trade measures. Whether and which of these measures effectively and efficiently reduce GHG emissions will be the essence of the NDC reviewing and reporting process established by the Paris Agreement.

At present, there is no internationally agreed list of such measures, and their efficiency and effectiveness can be subject to doubts. Even the smartest agricultural economists may be at

pains to identify measures with an exclusive contribution to GHG reductions, or to quantify the respective correlation with the Paris and other policy objectives. Moreover, some measures may defeat others, possibly better ones e.g. risk insurance subsidies may disincentive or postpone adaptation and technological changes, or food stockpiles could displace private and more efficient schemes. Still other measures are only available for large-scale investments, and to Finance Ministers with deep pockets. Finally, but most importantly for this enquiry, measures taken in one country may negatively affect climate resilience in another country.

Hence, for the purpose of our analysis, we list potentially available measures, not for their established or claimed climate-smartness but under a trade and investment focus. The seven categories in the below 'Climate Change Tool Box' for Agriculture have been chosen based on the author's recent research and in an increasing order of their potential trade effects i.e. in view of their potential relevance under WTO Law. They claim neither completeness nor actual trade impacts or trade rule issues. They only signal the types of policy measures which regulators may consider as making a substantial contribution to climate change mitigation or adaptation.

Box 1: Potentially climate-smart agricultural policy measures under a trade and investment focus

Research, Education and Extension (without a direct impact on exports)	Basic scientific research, policy advice, training and extension services
Legal Issues (with or without a trade impact)	Land tenure, women's rights, indigenous peoples' and communal rights, cooperatives reform, intellectual property rights along the food value chain, technology transfer provisions, cartels vs competition, other restrictions protecting local food value chains, access to courts and enforcement, legal assistance
Social policies (regardless of the source of finance)	(Small) farmer support schemes (including for fishermen, forest dwellers, nomads and other vulnerable groups), gender measures, food aid and school food schemes, emergency measures, migration policies
Production (with or without impact on exports or on import displacement)	Subsidies (investment and consumption incentives, exceptions for sensitive sectors), (staple) food support (infrastructure, operation), food safety improvements along the food chain, (subsidised) production risk insurance schemes, various forms of food stockpile policies, access to credits, meteorology tools, (agricultural) biofuels, biotech (GMO), organic agriculture, fuelwood, sequestration and local photovoltaic schemes
Commerce (with or without production and trade impact)	Commodity exchanges, weather (re-)insurance, (international) futures and other risk hedging instruments, regional, private and 'virtual' food reserve schemes, consumer information e.g. labelling

Investment (<i>whether national or international, or a combination of both</i>)	Impact assessments (<i>ex ante / ex post</i>) of bilateral and regional investment protection agreements and other instruments, investment and production credits, FDI incentives and investment contracts, ISDS
Trade	Tariffs, quotas (tariff-rate quotas or quantitative import restrictions), licensing, other border measures with a goods and services footprint differentiation component (BAM, ETS, differential CO ² taxes, performance requirements), safeguards (including climate-related exceptions e.g. prudential carve-outs for financial services), export taxes and restrictions, trade defence and balance of payments measures, infant industry protection, import standards and regulations, trade promotion; NTM (such as technical standards, conformity assessment procedures, local content requirements, various restrictions on climate-oriented services trade)

Source: Häberli (2016 and 2017a)

According to FAO research, at the time of writing this article very few NDC indicated the type of measures with a possible trade or (foreign) investment impact (Brenda and Zimmermann 2018). The preliminary legal analysis of some such measures in Section 4 will look at potential conflicts with trade rules of (1) climate measures taken at the border, (2) footprint taxes, (3) mitigation and adaptation incentives, (4) labels, and (5) risk management measures. Before that, Section 3 looks at the possibly relevant trade rules and case law.

3. WTO Rules and Case Law Relevant for Climate Action

The relevant rules and commitments agreed by the WTO membership enshrine non-discrimination as their basic principle. This section starts by explaining where this principle can help to reinforce climate action – and where it might hamper it (1). Some specific WTO rules for agriculture show similar issues (2). This leads to the question whether the available exceptions allow for climate action (3), and how the Paris Agreement and the WTO try to address legitimate development concerns, within the overarching respective commitments to reduce greenhouse gases and unjustified obstacles to trade (4). Finally, even though Regional Trade Agreements do not contain numerous substantive disciplines and policy constraints in respect of agriculture-related climate-smart policies, a look at their procedural components shows a potentially powerful incentive for trading partners to adopt such policies without trade distortions (5).

1 Basic WTO Non-Discrimination Trade Rules

According to the preamble of the WTO Agreement, the main objective of the World Trade Organization is 'raising standards of living, ensuring full employment and a large and steadily growing volume of real income and effective demand' basically by 'reciprocal and mutually advantageous arrangements directed to the substantial reduction of tariffs and other barriers to trade and to the *elimination of discriminatory treatment* in international trade relations.'¹⁵ Like for the Paris Agreement, the attainment of these objectives has been qualified in 1995 by a number of sustainable development considerations: "allowing for the optimal use of the world's resources in accordance with the objective of sustainable development, seeking both

¹⁵ UNTS, vols. 1867, 1868 and 1869, No. 1-31874, and annex A in vols. 1890 and 1895 (emphasis added)

to protect and preserve the environment and to enhance the means for doing so in a manner consistent with their respective needs and concerns at different levels of economic development.”

According to the WTO Appellate Body this preamble text ,gives colour, texture and shading to the rights and obligations of Members under the WTO Agreement.¹⁶ It seems to offer a large discretion to the WTO membership in determining their own environmental objectives, policies and regulations (including their trade impact). Nonetheless – and here is the red line! – ,that autonomy is circumscribed only by the need to respect the requirements of the General Agreement and the other covered agreements.¹⁷

The most important WTO requirement can be described very simply as a prohibition of discrimination. The purpose is to avoid protectionism in the application of internal measures to imports. This means non-discrimination (a) between products and services of different foreign origins (MFN – Art. I GATT) and (b) between products and services of foreign and domestic origin (NT – Art. III GATT). WTO Law aims at preventing trade distortions and promoting competitive conditions between imported and domestic products. It does not ask for the objectives of, say, a climate-smart measure. But, since 2015, it prohibits all export subsidies i.e. even measures which might make sense under a mitigation perspective, such as export subsidies for low-footprint foodstuffs. Incidentally, WTO rules do not prevent self-discrimination, such as taxing GHG emissions arising from domestic food production only.

The main problem for climate-smart policies is the prohibition of discrimination between otherwise ‘like’ products differing in respect of their carbon footprint resulting from different production and processing methods (PPM). For instance, a BAM on imported commodities produced with a high GHG output cannot exceed taxes applied to ,the like domestic product or in respect of an article from which the imported product has been manufactured or produced in whole or in part’ (Art. II:2(a) GATT).¹⁸ The essential question which will have to be answered on a case-by-case basis is whether the imported product is really a ‘like’ product, and whether it is accorded ‘less favourable’ treatment than that accorded to like domestic products.¹⁹ The likeness test generally applied under WTO Case Law comprises four categories of ‘characteristics’ that the products involved might share: ,(i) the physical

¹⁶ AB Report, *US — Shrimp*, paras. 152, 153 and 155

¹⁷ AB Report, *US — Gasoline*, Findings and Conclusions (p. 28), available at <http://docsonline.wto.org/imrd/directdoc.asp?DDFDocuments/t/WT/DS/2ABR.WPF>

¹⁸ The obligation of non-discrimination in respect of ‘like’ products (once they have been cleared through customs) is also formulated in Article III:2. GATT-Article III:4 also encompasses the obligation of non-discrimination in respect of all internal regulations, regardless of their purpose (emphasis added):

‘The products of the territory of any contracting party imported into the territory of any other contracting party shall be accorded *treatment no less favourable than that accorded to like products of national origin* in respect of all laws, regulations and requirements affecting their internal sale, offering for sale, purchase, transportation, distribution or use. The provisions of this paragraph shall not prevent the application of differential internal transportation charges which are based exclusively on the economic operation of the means of transport and not on the nationality of the product.’

¹⁹ The Appellate Body cited the Report of the Working Party on Border Tax Adjustments, BISD 18S/97, para. 18. The same test was used in Appellate Body Report, *Canada — Periodicals*, pp. 21–22, and in many other cases. It is also worth noting that ,likeness’ has been defined in the same way under Articles II:2 and III:4 GATT (cf. Appellate Body Report, *Thailand — Cigarettes (Philippines)*, para. 116).

properties of the products; (ii) the extent to which the products are capable of serving the same or similar end-uses; (iii) the extent to which consumers perceive and treat the products as alternative means of performing particular functions in order to satisfy a particular want or demand; and (iv) the international classification of the products for tariff purposes.’ In the same case the Appellate Body also made it clear that a panel needed to examine, in each case, all of the pertinent evidence.²⁰

Clara Brandi has noted a particular difficulty for the legal assessment of the so-called ‘non-product related PPMs’ (npr-PPM) which leave no trace in the final product. She rightly points out that the multilateral trading system does not make a clear distinction between products solely based on their levels of embedded carbon.²¹ Whether such products can be considered ‘unlike’ has never been settled in a WTO legal dispute.

Actually, it could even be argued that certain incentives offered to climate-friendly product imports are a form of discrimination against ‘like’ products with a lesser mitigation impact. In a case with automobile subsidies and local content requirements (TRIMS), the Panel held that ‘a condition which must be met in order to obtain an advantage consisting of the right to import certain products duty-free’ can be subject to the NT obligation in GATT-Article III:4, even if compliance is not mandatory.²²

As to the other condition for a violation of the non-discrimination obligation, the ‘less favourable treatment’, the way a climate standard is applied to imports and to local producers may come under WTO scrutiny. In a case dealing with gasoline quality requirements the Panel ascertained that ‘the measure in question afforded to imported products less favourable treatment than that afforded to domestic products because sellers of domestic gasoline were authorized to use an *individual baseline*, while sellers of (chemically identical) imported gasoline had to use the more onerous *statutory baseline*.’²³ What matters here is, again, effective equality of competitive opportunities.

2 Specific Rules for Agricultural Trade possibly applying to Climate Measures

The main provisions for trade in agricultural products are found in the WTO Agreements on Agriculture (AoA) and on Subsidies and Countervailing Measures (SCM). Basically, rules and limits apply to four categories of protection and support policies.

- 1) Border protection is strictly limited to tariffs.²⁴ The maximum rates (‘bound’/‘scheduled’) cannot be increased without compensation (GATT-Article XXVIII). Import quotas are prohibited under Article XI GATT. Rapidly increasing import volumes or price decreases may legitimise a ‘safeguard’ action by countries having had to transform their NTB into tariffs. An additional but time-limited border

²⁰ Appellate Body Report, *EC — Asbestos*, paras. 100–103

²¹ Brandi (2017), p.4, also referring to differing scholarly interpretations by Low, Marceau and Reinaud 2011, Grubb et al. 2015, Bacchus 2016 and Hawkins 2016.

²² Panel Report, *Canada — Autos*, para. 10.73

²³ Panel Report, *US — Gasoline*, para. 6.10 (parenthesis added)

²⁴ Footnote 1 to AoA-Article 4.2 provides that ‘any measures of the kind which have been required to be converted into ordinary customary duties’ include ‘quantitative import restrictions, variable import levies, minimum import prices, discretionary import licensing, non-tariff measures maintained through state-trading enterprises.’

protection is available against imports threatening or jeopardising local production (GATT-Article XIX). But 'climate safeguards' at the border do not exist.

- 2) Domestic support is either trade-distorting or not and, consequentially, limited or not. Except as outlined for category 4 below, there is no outright prohibition of agricultural product subsidies, but because they are considered to distort trade, they are limited for each and every WTO Member. The trigger and the conditions for unlimited governmental programmes are narrowly defined in the so-called Green Box (Annex 2 AoA). Eligible programmes which are possibly climate change-relevant include natural disaster relief, domestic food aid, food security stockpiles and income insurance, and other income safety nets discussed in Section 4.5 below. Yet, many developing countries now find themselves both without the financial means, and with little leeway under their Amber Box limits, to finance climate adaptation with programme support. True, there is a 'Developing Country Green Box' (AoA-Article 6.2) which allows, say, certain credit schemes and subsidies e.g. for irrigation construction, and even running costs of low-income and resource-poor producers.²⁵ However, the small print in this rather contorted text seems to offer little scope for specific climate measures - even though it did not prevent rapidly increasing notifications by many developing countries, including clearly product-specific programmes in large surplus producers like India, or in oil producing countries like Oman. In the absence of case law, it is unclear whether the alleged general development and poverty concerns would pass the test of WTO-compatibility for such measures. Given that, according to Smith et al (IPPC 2014), more than 90% of GHG emissions from agriculture, forestry and other land use (AFOLU) come from developing countries, a very careful review of the exact use of Article 6.2 by some of the largest developing countries seems to be important. So far, climate adaptation has not yet been mentioned as a motive for Article 6.2 policies.
- 3) Export subsidies, a long-term concern of many competitive agricultural product exporters, were finally prohibited in December 2015, at the 10th Ministerial Conference in Nairobi. But the rules tightening mandated under the Doha Development Agenda (DDA) never reached consensus. Nonetheless, other potentially climate-relevant export competition instruments, namely export credits, international food aid, and state-owned export companies can be examined under the recourse to anti-circumvention provisions of AoA-Article 10 and, for state trading, GATT-Article XVII. Relevant case law (briefly described in Section 4) indicates limits for certain climate adaptation tools even of a temporary nature.
- 4) In line with AoA-Article 13, the WTO Subsidies Agreement (SCM) now also applies to agricultural export (and import displacement) measures. For climate mitigation purposes the strict disciplines under the SCM may become a problem. It is agreed that the origin of, say, methane is irrelevant for its impact on global warming. Hence, at least a time-limited subsidy to reduce agricultural GHG emissions in the EU or in the USA might actually have a beneficial impact; it could even be more effective than

²⁵ Article 6.2 provides in relevant parts that measures which are "an integral part of the development programmes of developing countries" [...] "shall be exempt from domestic support reduction commitments that would otherwise be applicable to such measures". These are "*investment subsidies* which are generally available to agriculture in developing country Members and *agricultural input subsidies* generally available to low-income or resource-poor producers in developing country Members" (italics added).

financing mitigation efforts by, say, all Sub-Saharan farmers. Nonetheless, the said incentive might fall foul of the SCM prohibition applying to subsidies that are specifically provided to an enterprise or industry or a group of enterprises or industries. On the other side, if farm subsidies claiming climate adaptation without actually doing so are to be avoided, any loosening of WTO disciplines might serve as a pretext for farmers to displace foreign competitors.

Incidentally, developed countries may also find problems in regulating imports in the wake of a disaster. The European Union used to issue so-called 'hurricane licences' allowing EU producers, after a tropical storm, to import bananas from other countries. The original Panel had found that (exclusively) "producer organizations or operators can expect, in the event of a hurricane, to be compensated for their losses in the form of 'quota rents' generated by hurricane licences." The AB agreed, and noted that this practice affected the competitive conditions in the market in favour of bananas with EU origin, adding as its constant red line "[w]e do not dispute the right of WTO Members to mitigate or remedy the consequences of natural disasters. However, Members should do so in a manner consistent with their obligations under the GATT 1994 and the other covered agreements."²⁶

Clearly, climate change hits the screens of agricultural policymakers at a time of unfinished WTO business. The playing field, put simply, is not even. This can have serious consequences for food exporting and importing countries without substantial border protection, major subsidy allowances, or the remaining export promotion instruments. The main reason for this systemic weakness in WTO rules is the failure of the Doha Round negotiations, stalled since 2008, to pursue the 'reform process' under Article 20 AoA, and to agree on additional disciplines making trade patterns more sustainable, and more resilient under a climate change perspective.

3 Exceptions, Interpretations, Amendments and Waivers

As explained in Section 1 above, all national measures can be challenged by any concerned WTO Member and at any time. This right to complain, of course, is without prejudice to the ruling reached in a dispute. However, measures found not to be in conformity with the agreed WTO rules and market access commitments face the possibility of being reversed or otherwise sanctioned.

There is no rule without exceptions. Environmental protection qualifies in principle, if not in practice, as a legitimate exception for an otherwise WTO-incompatible measure under Article XX GATT. There are other exceptions as well. In this section we only look at the most relevant exceptions for environmental protection in general, inasmuch they might be found relevant for climate measures. As in the whole article we refrain from reaching conclusions as to the applicability of such exceptions, and on the WTO-compatibility of any specific measure.

The general exceptions in GATT-Article XX allow Members to take all necessary measures, for instance 'to protect public morals' (lit. a); 'to protect human, animal or plant life or health' (lit. b); 'relating to the conservation of exhaustible natural resources if such measures are made effective in conjunction with restrictions on domestic production or consumption' (lit.

²⁶ AB Report, *EC — Bananas III*, para. 213

g). The somewhat antique language in lit. g dates back to 1947; but it has been clarified in a range of adjudicator decisions that, for instance, 'natural resources' include endangered species such as sea turtles.²⁷

Case law shows that many defences invoking Article XX exceptions were found not to justify a rules violation. The interesting question here would then be whether a Panel or the Appellate Body may theoretically find an incriminated climate-related measure to be legitimately based on binding public international law. The possibility of environmental treaty law prevailing under trade law is expressly foreseen under the Vienna Convention (VCLT), and has been recognised by the Appellate Body. Such a finding would then uphold the incriminated measure, and prevent retaliation by the complainant. However, so far no WTO ruling has ever recognised the mandatory nature of an environmental treaty in a specific case, or of a generally applicable international environmental standard.

The Appellate Body has repeatedly enjoined panels to allow both for a maximum policy space and to respect public international law such as environmental norms and human rights. In particular, panels are tasked with a 'holistic' treaty interpretation pursuant to the customary rules as provided for in VCLT-Articles 31 and 32.²⁸ At the same time, panels as well as the AB itself do not and cannot make any new rules (Art. 3.1 DSU). They must look at the various exceptions foreseen in the WTO agreements, and invoked by the respondents. But they also have to respect the so-called 'chapeau' of Article XX providing that all exceptions remain subject 'to the requirement that such measures are not applied in a manner which would constitute a means of arbitrary or *unjustifiable discrimination* between countries where the same conditions prevail, or a *disguised restriction on international trade*.' (emphasis added) This again is the red line where so far virtually all measures claiming Article XX exceptions as a legal base have failed the test of non-discrimination. For instance, the EU tried to justify its seals product import ban with its (self-defined) 'public morals' (Art. XX lit.a GATT), arguing that its import ban of seals products responded to public concerns about killing seals and their babies. In order to justify a marketing prohibition exception for seals hunted by Inuit of EU origin, it also invoked international standards outside WTO Law, adhered to by all the parties in that dispute, and laid down in various ILO Conventions,²⁹ the UN Declaration on the Rights of Indigenous Peoples³⁰ and OIE *Guiding Principles on Animal Welfare* included in the OIE Terrestrial Animal Code in 2004. Both the Panel and the Appellate Body accepted the admissibility in principle of 'public morals' as a justification for trade discrimination. Nevertheless, they agreed with the complainants that the EU had not established that its seals regime had no less trade-restrictive alternative to a partial and discriminatory ban; they also found that the invoked international standards did not compel the EU to proscribe imports.³¹

²⁷ AB Report, United States — Import Prohibition of Certain Shrimp and Shrimp Product, para 131

²⁸ Cf. AB Report *US – Continued Zeroing*, para 268; AB Report *EC – Chicken Cuts*, para 176.

²⁹ ILO Convention 169 *Indigenous and Tribal Peoples Convention* (1989)

³⁰ Official Records of the UN General Assembly, Sixty-first Session, Supplement No. 53 (A/61/53), part one, chap. II, sect. A

³¹ The complainants had argued that „the international agreements cited by the European Union before the Panel do not require the European Union to protect the interests of Inuit or other indigenous communities by discriminating against the products of non-indigenous peoples.“ AB Report *EC – Seals*, para 2.4.

Whether environmental treaty law will ever justify a trade rule violation in a WTO dispute remains an open question. As already pointed out, no WTO ruling has ever acknowledged the existence of a conflict between WTO and other international treaty rules, which would then have called for a decision on whether a general principle of law prevailed over WTO Law. The AB, never shy of admonishing panels to take international treaty law into account, forgot to even mention the VCLT in its final ruling in the seals case. Only one (unappealed) panel decision ruled that « the principle of precaution is a 'general principle of international law' » and could thus be « considered a 'rule of international law' within the meaning of Article 31(3)(c) » (VCLT).³²

There are further exceptions for all these rules. But it is far from being established that, say, mandatory cost internalisation of GHG emissions under a polluter-pays-principle would be found WTO-compatible if it was applied not only to domestic producers but also to imports. This being, so far no agricultural policy measure has had to pass such a test – simply because very few appear to have been taken; very few can be detected in the NDC, and none have been notified to WTO or reported in trade policy reviews.

Window 1: The Story of the EU's ETS Extension to Aviation

³² Panel Report *EC – Biotech*, para 7.67 (emphasis added). Isabelle Van Damme (2009, p. 369) noted that this Panel had recognised that treaties and general principles of law could constitute 'rules of international law' thereby rejecting a defence brought by the United States when it ruled that it did have the discretion to consider such rules as 'context' in order to determine the 'ordinary meaning' under Article 31.1 VCLT.

The EU Aviation Directive is a case in point where several countries, including China, Malaysia and the USA, argued that this measure violated WTO non-discrimination rules, even though according to the *Annex on Air Transport Services* such services are explicitly excluded from the scope of the GATS. Accordingly, they threatened with retaliation if the EU should go ahead regardless with its Directive introduced in 2012. The issue – and the fundamental question whether the EU's aviation scheme could be justified (here under Article XIV of the GATS) – was never addressed in a WTO dispute. Subsequently, the EU had to suspend this climate-friendly measure by which all airlines, regardless of their origin, would have had to acquire and 'surrender' to the EU allowances for the CO² emissions produced by their aircrafts. Bartels (2012) shows that border carbon adjustments varying with transport distances might not withstand a WTO legal challenge. He also demonstrated that the EU's scheme violated its international civil aviation obligations, after it had failed to obtain an international agreement on an aviation ETS within the framework of the International Civil Aviation Organization (ICAO).

A carbon scheme that is administratively feasible and WTO-compatible remains to be found. Meltzer (2012) pointed out, while recognising the imperative need for action to address climate change, that it will be crucial to manage the trade and climate change intersection in ways that maintain the integrity of the WTO system. He argued that the WTO rules which the EU Aviation Directive might have violated are actually useful disciplines guiding countries in the development and application of climate action, without impeding international trade. Hence, the basic challenge in his view is to find an appropriate balance between policy space of WTO Members for CO² reduction measures, while maintaining an open and non-discriminatory trading system that supports economic growth and global welfare.

The WTO rulings for renewable energy measures are another sobering lesson for 'mutual supportiveness' advocates. Only one fossil fuel case was ever settled in a formal dispute.³³ In that case the AB finding that the air contamination standards applied to domestic vs foreign gasoline did not meet the 'less trade restrictive' condition of the chapeau of Art XX; in that case, raising the domestic standard would have solved the WTO problem – and reduced air pollution.³⁴ But all of over a dozen disputes (cf. **Box 2**) on water, solar and wind energy ended with the respondents failing to convince WTO adjudicators that the incriminated measures did not afford additional protection to their domestic interests (NT) or discriminate between different foreign suppliers (MFN).³⁵ To the extent that a final ruling had been made public by the time of writing this article, all respondents had to withdraw or to adjust their incriminated measures. Without putting in doubt the legal justification of these rulings, this is

³³ The ruling in another fossil fuel case was still pending at the time of writing: DS476 EC – Energy package which directly challenges EU subsidising programs on gas. According to the WTO website, the panel report is about to be published.

³⁴ *US – Gasoline* (DS 2 and DS 4). This classic WTO case already referred to in **FN15** above is about a regulation by the United States' Environmental Protection Agency under the Clean Air Act of 1990, set up to control toxic and other pollution caused by the combustion of gasoline manufactured in or imported into the United States. The AB reversed the Panel and found that the regulation did fall within the terms of GATT-Article XX(g). It nonetheless concluded that the so-called baseline establishment rules in the US regulation 'fail to meet the requirements of the chapeau of Article XX of the *General Agreement*, and accordingly are not justified under Article XX of the *General Agreement*.' (Appellate Body Report *US – Gasoline*, dated 29 April 1996, p.28 lit.a and c – italics in the original)

³⁵ De Bièvre, Espa and Poletti (2017) have tried to explain the quasi-absence of fossil fuel cases and the "skewed distribution of energy subsidies dispute settlement complaints at the WTO." They correctly noted that, rather than addressing the general harmfulness of all energy subsidies under the ASCM, most of these cases focus on renewable project incentives subject to local content requirements.

perhaps an indication that future agricultural cases might well come to the same impasse under a climate change mitigation perspective, i.e. blocking the way for a number of otherwise climate-smart policies.

Box 2: Renewable Energy Measures under the WTO Fire

Case Number	Respondent and (Short) Title	Complainant	Current Status
DS 419	<i>China — Measures concerning wind power equipment</i>	United States	In consultations since 22 December 2010
DS 412	<i>Canada — Renewable Energy</i>	Japan	Implementation notified by respondent on 5 June 2014
DS 426	<i>Canada — Feed-In Tariff Program</i>	European Union	Implementation notified by respondent on 5 June 2014
DS 421	<i>Moldova — Environmental Charge</i>	Ukraine	Panel established, but not yet composed on 17 June 2011
DS 437	<i>US — Countervailing Measures (China)</i> ³⁶	China	Report(s) adopted on 16 January 2015, with a recommendation to bring measure(s) into conformity
DS 443	<i>European Union and a Member State</i> ³⁷ — <i>Certain Measures Concerning the Importation of Biodiesels</i>	Argentina	In consultations since 17 August 2012
DS 449	<i>US — Countervailing and Anti-Dumping Measures (China)</i>	China	Report(s) adopted, with recommendation to bring measure(s) into conformity on 22 July 2014
DS 459	<i>European Union and Certain Member States — Certain Measures on the Importation and Marketing of Biodiesel and Measures Supporting the Biodiesel Industry</i>	Argentina	In consultations since 15 May 2013
DS 473	<i>European Union — Anti-Dumping Measures on Biodiesel from Argentina</i>	Argentina	Panel report under appeal on 20 May 2016
DS 452	<i>European Union and certain Member States — Certain Measures Affecting the Renewable Energy Generation Sector</i>	China	In consultations since 5 November 2012
DS 480	<i>EU — Biodiesel</i>	Indonesia	Panel composed on 4 November 2015
DS 456	<i>India — Solar Cells</i>	United States	Panel report dated 20 April 2016 under appeal
DS 510	<i>US — Renewable Energy</i>	India	Panel established, but not yet composed on 21 March 2017

Source: WTO Webpage (https://www.wto.org/english/tratop_e/dispu_e/dispu_subjects_index_e.htm) verified as of 4 September 2017

³⁶ Including subsidies for solar panels and wind towers

³⁷ Spain

As matters stand today we are forced to conclude that the emerging WTO case law possibly relevant for climate change-related measures basically maintains all fundamental non-discrimination principles. The complex interfaces between environmental and trade standards remain an understudied and apparently non-negotiable topic. At any rate, no environmental treaties and standards have been accepted as justifying violations of a WTO rule. Things might yet change without a rules amendment.³⁸ However, the present situation is hardly an invitation for regulators to adopt climate measures without a reasonable assurance of legal security.

It is often said that legal security for regulators and operators can be obtained in only two ways: negotiate – or litigate. This new issue of climate action without trade friction requires swift action. Nonetheless, negotiation without an interdisciplinary issues assessment is bound to fail. And litigation must come second, in order « to clarify the existing provisions » (Art. 3.2 DSU).

For instance, the legal insecurity for all Article XX type of exceptions leads to the question whether the implementation of the Paris Agreement requires WTO to consider rules amendments which do not impair trade security. Common law practitioners tend to consider AB findings as Case Law with capital letters, and as a final interpretation of the specific WTO rule at issue. However, each and every AB/DSB ruling only applies to the case at hand. Litigating parties, and adjudicators, can always argue in another case that a different interpretation is more appropriate. Before we look at Amendments and Waivers it should be pointed out that the authority to issue a legally binding *interpretation* rests solely with the highest WTO body, the General Council (Art. IX:2 of the WTO Agreement) – as opposed to an interpretation in dispute settlement, subject to DSU-Article 3.2.³⁹ So far, no such legal interpretation has been adopted by the General Council.

Notwithstanding the rather dogmatic judiciary, and the ‘splendid isolation’ of the multilateral trading system, it should be noted that all WTO provisions can be the object of *amendments*. Here too, only the General Council can take such a decision, with a majority of at least three fourths of the membership (Art. X of the WTO Agreement). The only precedent is the ‘affordable drugs’ amendment of the TRIP Agreement. This was the first ever amendment of a WTO rule, without relevance for climate policies.⁴⁰

The same procedure applies to *waivers* in favour of a particular Member or group of Members allowing them not to comply with specific rules and obligations. Waivers are more frequent and somewhat easier to obtain than amendments, but they have time limits, and each extension has to be justified.⁴¹ One specific example at the juncture between Trade

³⁸ To take a perhaps not too remote example, an indirect government preference for domestic competitors threatened by, say, rising sea levels, might perhaps find acceptance in a WTO dispute as a Paris-related measure, even though it could *de facto* discriminate foreign suppliers and products.

³⁹ According to DSU-Article 3.2 the rulings and recommendations of the DSB serve only ‘to clarify the existing provisions of those agreements’ and ‘cannot add to or diminish the rights and obligations provided in the covered agreements.’

⁴⁰ The General Council Decision of 6 December 2005 (WT/L/641 dated 8 December 2005) ‘Amendment of the TRIPS Agreement’ entered into force on 23 January 2017, replacing a 2003 waiver for members who since then have accepted the amendment.

⁴¹ Cf. Article IX of the Marrakech Agreement Establishing the World Trade Organisation (the ‘WTO Agreement’); the Guiding Principles to be followed in considering applications for waivers adopted on

and Human Rights – the only one involving ‘non-product-related PPM’ – might show a way forward. The ‘Kimberley Waiver’ was adopted in 2006, allowing importers to deny MFN market access rights to so-called *blood diamonds* (the revenue from diamond sales financed authoritarian regimes, oppression and conflict).⁴² Again, whether a proposal by a number of parties to the Paris Agreement to the WTO General Council for a (presumably much more general) amendment or a waiver would be acceptable to the trading constituents is an open question. The threshold, at any rate, would be high; nowadays, wide-ranging waivers are few and far between.

The underlying principle is that – just like the Paris Agreement – the WTO’s DSB cannot rule on the policies or their objectives, only on a specific measure taken by one of its members. Neither can it prescribe ‘good governance’ or ‘good policies.’ Put simply, its only role is to protect its membership against protectionism. Also, the WTO litigation procedure is ‘automatic’ in the sense that when a complainant considers that its WTO rights are infringed by another member, it can and will obtain the establishment of a dispute settlement panel. Such a panel is then bound to report its findings to the Dispute Settlement Body (DSB) which in turn will ‘automatically’ endorse these findings (except by a never-happened consensual rejection). Both parties can appeal these findings. Ultimately the AB is, like the panels, bound to submit to the DSB its findings on the compliance of the revised measures with the WTO obligations of the respondent. A non-compliance ruling adopted by the DSB allows the complainant to eventually demand enforcement through the ‘arbitrator’, usually the original Panel, if need be by recourse to the so-called retaliation procedure involving an authorisation to ‘withdraw concessions.’ At this stage, the arbitrator would determine the maximum retaliation amount; the AB and the DSB cannot review or correct that amount. The complainant is then free to apply punitive tariffs above the MFN level against imports from the respondent.

The only scenario by which this ‘automatic’ settlement of disputes might look beyond WTO would be if a panel or the AB, based on the VCLT, find in a specific case that international treaty law supersedes WTO trade law. At any rate, in view of the above-mentioned case law, and the at least initially extremely large leeway afforded by the Paris agreement, climate change mitigation measures are unlikely candidates for a WTO revolution, even under the most activist WTO judges.

What can then be said at this stage except that, at a very general level, WTO Law and practice appear as a self-contained bulwark against discrimination – including discrimination inherent in climate-smart measures with a collateral negative trade impact? On the other side, while the diplomatic presumption of ‘mutual supportiveness’ turns out to be a poor guide for NDC formulation, it is equally impossible to conclude that no exception, amendment or waiver can cure the discriminatory implications of footprint differentiations.

1 November 1956 (BISD 5S/25); the Understanding in Respect to Waivers of Obligations under the General Agreement on Tariffs and Trade 1994; and Decision-Making Procedures under Articles IX and XII of the WTO Agreement agreed by the General Council (WT/L/93).

⁴² Kimberley Process Certification Scheme for Rough Diamonds. General Council Waiver Decision of 15 December 2006, WTO Document WT/L/676 dated 19 December 2006. The waiver has been extended until 31 December 2018 by a decision of the General Council dated 11 December 2012 (WTO Document WT/L/876 dated 14 December 2012).

In our preliminary legal analysis in Section 3 we look at some of the emerging patterns for the implementation of the Paris Agreement in the light of relevant WTO provisions. Again, this is not a legal opinion, but an initial discussion of different instances where climate measures or specific NDC might face WTO challenges under one of the WTO provisions listed in **Box 5**.

Before looking at the already available NDC, however, it is perhaps useful to briefly look at another difference between the WTO and the Paris Convention, namely the way each of these treaties deals with the development differences between their constituents.

4 Addressing Development Concerns

Under the Paris Agreement, the Principle of Common but Differentiated Responsibilities (CBDR) is an obligation for all parties when formulating their NDC. The above-quoted wording in Article 2.2 is the result of protracted negotiations about the role and impact of historic and present, and of relative and absolute GHG producers.

As said before, 'Paris' has no specific obligations on how to take the CBDR principle into account. Not surprisingly, most developing countries pledge to contribute to the goal of not exceeding global warming by more than 2°C, but they subject a part of their measures to the availability of funds. On their side, developed countries commit to not only reduce their footprint but – depending on domestic policy considerations and debates – to also finance climate programmes in poor countries in order to limit global warming to 1.5°C. Some of them do so by claiming ETS/IET credits; but all of them acknowledge the CBDR principle.⁴³

In the WTO, like for its predecessor the GATT, the development concerns of the membership are reflected in a quite different way. Each and every WTO Agreement acknowledges the development dimension, up to and including the most recent Trade Facilitation Agreement which foresees specific measures supporting developing country efforts to make trade flow more freely (TFA). Beyond the preambular language, the classic precept of reciprocal and multilateral concessions is toned down with numerous preferences from which only developing countries, or only least developing countries (LDC) will benefit. This means in WTO speak that 'Special and Differentiated Treatment' (SDT) is offered to (self-designated) developing countries and to LDC (i) for their rights in terms of exceptions, flexibilities, and differentiated rules, and (ii) for obligations relative to notification formats and deadlines, transparency, and other procedural and institutional provisions. The official list of SDT provisions presented at the Doha Ministerial in 2001 has 130 pages – but it appears to offer no help for the differentiation commitment under the Paris Agreement.⁴⁴ Especially large developing countries may not only find financial assistance hard to come by. More to the point here, trade rule exceptions such as 'infant industry' protection are likely to be very difficult to pass the test without a complaint. As shown in recent WTO Ministerial Conference

⁴³ Brazil, for its part, refused in its INDC the automatic use of market mechanisms (e.g. international ETS) that may be established under the Paris agreement; but this is not an issue under consideration in this article.

⁴⁴ WTO, Committee on Trade and Development, Implementation of Special and Differential Treatment Provisions in WTO Agreements and Decisions. Note by Secretariat dated 21 September 2001 (WT/COMTD/W/77/Rev.1)

issues (public stockholdings, or fisheries) the same goes for amendments and waivers (or pledges of non-litigation).

More importantly still, 'SDT' offers no avenues for measures addressing climate-related concerns of smallholders, women, nomads, or small fishermen as mentioned in the Paris Agreement. Obviously, such measures are difficult to design without the WTO having to look into domestic affairs. Any effort to accommodate such concerns in the WTO would have to avoid opening the door to all kinds of freeways whereby the gains of progressive and mutual trade liberalisation could again be squandered without a corresponding climate-friendly gain for all. Nevertheless, the challenge for any meaningful climate-smart SDT is to design support programmes without negatively impacting on market access rights and interests of third (developing) countries.

5 Climate Provisions in Regional Agreements

Before closing this general overview of multilateral trade rules a word is indicated on regional trade agreements (also called preferential, or free trade, or economic partnership agreements).

Generally speaking the new generation of RTA, especially 'North-South' treaties, emphasises the importance of sustainable development also in a trade and investment context; some make a special mention of climate change. However, none appears to have substantive 'WTO Plus' provisions relevant for climate mitigation measures, none has ever put any limits on domestic agricultural support, and (so far) none of them refers to the still newer Paris Agreement.

This does not mean that Regional Agreements cannot show a way forward for the dichotomy between trade and environment rules and societal concerns. Recent agreements typically contain exhortatory language over and above the hitherto usual preambular texts.⁴⁵ Whether a 'TPP11' will address climate change - as the originally signed text did - remains to be seen. Some RTA have extensive dispute settlement procedures possibly involving private operators and sometimes even civil society organisations, and all refer to relevant WTO disciplines. Most importantly for this article, the agreements concluded by the USA and the EU innovate in their procedural and institutional set-up provisions. The Joint Committees e.g. on Environment and Trade offer a pre-litigation avenue for a discussion between the trading partners. These institutional mechanisms can be said to at least match the corresponding WTO fora which often are exclusively staffed by trade diplomats. While actual sanctions are extremely rare, a 'regional' committee process can and does yield insights into the reasons for a government taking – or omitting – measures with a negative environmental impact. In addition, so-called cases of carbon leakage ('eco-dumping' and, similarly, 'socio-dumping') can eventually lead to a withdrawal of concessions not unlike under the WTO litigation procedures. The key to such sanctions is not the environmental degradation or a violation of

⁴⁵ For instance, the EU – Singapore FTA has some relevant rules on climate mitigation measures. Article 7.1 specifies that 'In line with global efforts to reduce greenhouse gas emissions, the Parties share the objective of promoting, developing and increasing the generation of energy from renewable sustainable non-fossil sources, particularly through facilitating trade and investment. To this effect, the Parties shall cooperate towards removing or reducing tariffs as well as non-tariff barriers and fostering regulatory convergence with or towards regional and international standards.'

basic workers' rights, but the trade distortion caused, for instance, by illegal logging or child labour.

Another reason underlining the importance of regional trade agreements is their more constraining review and deliberation process.

For instance, the institutional set-up in the *EU – Vietnam FTA* published on 1 February 2016 administers the commitments of the parties in respect of Multilateral Environmental Agreements (Art. 4) and of Climate Change (Art. 5, with a reference to UNFCCC and the Kyoto Protocol). In case of a disagreement, the standard trade dispute settlement procedures (arbitration panel and mediation) do not apply. But Articles 15-17 lay down the procedures for the Contact Points, the Specialised Committee on Trade and Sustainable Development, and for a Panel of Experts whose mandate is to look into divergences in respect of the treaty commitments.⁴⁶

A recent trade and climate-related example of unilateralism vs regionalism is the *USA – Peru Trade Promotion Agreement*. It also has sustainable development commitments including on environmental issues, and workers' rights and trade in forestry products. Trade distortions can be pursued in litigation. Notwithstanding this possibility, on 19 October 2017 the United States chose to take a unilateral measure instead of initiating a formal trade dispute. After the treaty procedures providing for a joint examination of complaints failed to stop non-certified tropical timber exports to the US, the USTR decided to block imports from a Peruvian trader allegedly engaged in illegal timber logging.⁴⁷ Peru responded immediately by pledging renewed efforts to build a robust forest system.⁴⁸

In the light of these elements, and given the remoteness of a climate-smart WTO, regionalism might appear, for the time being, as a slightly better, if still indirect, avenue to climate disciplines enforcement. Unilateral measures may fall foul of WTO doctrine protecting against discrimination, and insisting on internationally agreed standards. But a 'North-South' RTA might help enforcement of commitments under international environmental treaties, or ILO Conventions – thanks to the frequent power imbalance between parties.⁴⁹

In the WTO, even a serious discussion on environmental issues or workers' rights has so far been prevented by its membership. When will the trading community be ready to discuss climate measures?

4. A Preliminary Legal Analysis

As already indicated, none of the presently available INDC and NDC provide sufficient details on the ways and means to implement the Paris Agreement. Perhaps tellingly, the NDC of developed countries are even less specific in this regard, whereas many developing countries

⁴⁶ The agreed text of the EU-Vietnam Free Trade Agreement as of January 2016 is available on <http://trade.ec.europa.eu/doclib/press/index.cfm?id=1437> (downloaded on 20 October 2017).

⁴⁷ *World Trade Online*, published by Inside US Trade dated 20 October 2017. USTR Lighthizer, in announcing this decision, was quoted as saying „This unprecedented enforcement action demonstrates President Trump's strong commitment to enforcing our trade agreements and ensuring that trade is fair to the American people.“

⁴⁸ *Ibid.*, dated 23 October 2017.

⁴⁹ For Peru, and the treatment of allegations of illegal logging and workers' rights infringements under international treaty law, see Häberli (2017b).

have outlined their plans with more specificity. Particularly noteworthy in this respect is China's INDC which describes a number of potentially climate-smart agricultural modernisation programmes. In poorer countries the declared intentions to comply with their Paris commitments are partly subject to the availability of sufficient funds – a right which might be compromised by the withdrawal of the US signature. Countries like India also insist that climate change mitigation cannot come at the expense of their development.

Given the present lack of precision and enactment of concrete implementation measures with a potential trade impact, only a preliminary legal analysis under a WTO perspective will be possible here. Based on recent literature describing climate-related border measures and subsidies, our considerations in this section will look at a number of measures envisaged in the various NDC (Benda and Zimmermann/FAO 2018). We particularly look at five types of programmes, likely to have repercussions on trade and services and investment, namely climate-related agricultural border measures (1); taxes (2); subsidies (3); climate tools intended to shape producer and consumer behaviour with other means, such as Non-Tariff Measures (NTM) by way of consumer information labels (4); and some risk management and risk insurance instruments (5).

1 Border Measures

The Paris Agreement, without saying so, implies counteracting 'like' products and services with a higher footprint. Even the choice of energy producing such goods may be 'discriminated' where countries move out of coal, if they then expect imports to have been produced in a comparable climate-friendly way. This of course can take place in a number of different ways, and not necessarily through discrimination of only foreign goods (MFN/NT).

To be clear, Paris does not prescribe border adjustment measures (BAM). The specific situation in each country and region, and the rapid technology development in this field, prevent a general assumption on the necessity of BAM. For instance, whether a carbon tax yields a better result, for global food security, than carbon sequestration, depends on many different factors.⁵⁰ Hence, the WTO would be ill-advised not to examine the possibility for a legal pathway including BAM.

Political expediency in many countries will often demand compensation for climate adaptation efforts, and restrictions at the border corresponding to those at home. Without a clarification in respect of BAM, the climate-smart policy measures outlined in **Box 1** might well have to forego both restrictions and prohibitions at home and at the border. The tool box would then be limited to 'carrots' such as R&D, technology transfer, ODA, and other clearly Green Box support. Whether countries can then meet their Paris commitments with carrots alone is an open question. Politically speaking, the sensitivity of agriculture makes self-discrimination extremely difficult, consisting in giving away 'carrots' abroad without BAM.

⁵⁰ A recent study on carbon sequestration was provided by Frank et al (2017) showing that, in certain developing countries, increasing soil carbon sequestration on agricultural land would not only allow reducing the calorie loss implied, thereby limiting the impact on undernourishment to 20–75 million people. In addition, sequestration would store significant amounts of carbon in soils, and be more efficient in terms of food security, than a carbon tax.

Such a 'circle of action paralysis' could also apply to 'sticks' at home involving production prohibitions, or the internalisation of carbon emissions costs e.g. through taxation.

Perhaps tellingly, the FAO survey of INDC and NDC has shown no concrete examples of governments explicitly proposing to implement climate-related agricultural BAM in order to ensure equal treatment of imports and national production mitigation policies (Benda and Zimmermann/FAO 2018). Some intervention proposals are sufficiently broad and general to potentially include BAM. But even New Zealand – the only country known to have envisaged such a measure because of the high absolute GHG production of its agricultural industry – is now no longer officially contemplating such measures. The main reason for this 'general inaction' may lie in the fact that so far only mitigation and adaptation subsidies are being proposed or introduced. As pointed out above, another reason is the legal uncertainty of BAM under WTO trade rules. Unlike for renewable energies, there is no case law here. But as pointed out below, WTO compliance of border adjustment measures remains an open question, and the risk of failing to comply with general and/or specific rules is high. Holzer (2014) provides a good overview of different scholarly views and practice in this legal minefield, and a detailed analysis of merchandise trade implications of carbon-related BAM.

This being, many NDC indicate a commitment to develop some sort of policy framework and institutional developments geared towards the mitigation of GHG emissions. China, for example, includes commitments to strengthen laws and regulations on climate change, and to implement their National Program on Climate Change and provincial climate programs. These are commitments that could include everything or nothing, but it is easy to see that a BAM could be part of broader efforts to shape the legal and regulatory sphere necessary to agree on an ambitious climate mitigation package.

Very few more NDC specifics are available. One outstanding example is South Africa stating that policy instruments under development include regulatory standards and controls for specifically identified GHG pollutants and emitters. Given South Africa's particularly strong exposure to climate change, this could be read as part of an ambitious mitigation programme requiring sacrifices at home, but also as a pointer towards BAM possibly conflicting with WTO rules.

Actual border measures differing for identical imports save for a different footprint, or applying to goods with a higher footprint than that of 'like' domestic products have not yet been notified to the WTO. Here, the legal limits are clear: not only are tariffs in excess of the scheduled MFN rates prohibited. Several DSB rulings banned a number of measures such as variable import levies or discretionary licensing (which under Article 4.2 were to be 'tariffied' i.e. transformed into tariffs) – even when they did not breach the MFN level.⁵¹

It should also be remembered that scheduled (i.e. bound) tariffs can be raised again, but only with adequate compensation offered to so-called 'principal' and 'substantial suppliers' of the goods involved (Art.XXVIII GATT). Other procedures apply to a modification of services commitments (Art.XXI GATS). Whether tariff increases (without differentiation) are conducive to better climate adaptation is another question.

⁵¹ *Chile — Price Band System and Safeguard Measures Relating to Certain Agricultural Products* (DS 207)

However, the most important impediment for BAM by way of tariffs or taxes differentiating according to footprints, or air transport distances, are the already mentioned national treatment provisions in Articles III:2 (prohibiting unjustified tariff differences) and III:4 GATT (allowing only legitimate regulatory distinctions).

Solutions are definitely difficult to come by. Policymakers and operators willing to reduce GHG emissions at home are unlikely to accept what in their view amounts to 'eco-dumped' competing products. On the other hand, if a domestic subsidy were to not only reduce carbon footprint but, in addition, lower production costs and increase exports, a close look at how such climate measures are formulated and implemented would be necessary. A 'more than climate-necessary' subsidy element would have to be excluded from, say, a WTO rules amendment for purposes of Paris implementation of the type discussed in Section 3.3 above. Perhaps the same necessity requirement would have to be built into an economic assessment of antidumping measures or countervailing duties, and for the below discussed subsidies and other incentives (Section 4.3). Again, internationally agreed standards would provide an extremely useful threshold here.

At this point, and in agreement with much of the recent literature, we have to conclude that BAM look like rather difficult propositions in the absence of agreed and mandatory international standards (Kang 2010, Holzer 2014).

2 Tax My Footprint?

Taxes on activities which are considered socially undesirable are sometimes called 'sin taxes'. Their intended effect is preventive (as opposed to taxes or fines for damages to society). Classic examples along the food chain are sumptuary taxes to mitigate the use of alcohol or tobacco. A fully successful soda tax on sugar-sweetened beverages was launched in Berkeley/California. Francis, Marron and Rueben (2016) describe the initial resistance to this scheme, its results compared with other Californian municipalities, and the very rapid spread of soda taxes worldwide. Political acceptance even in 'tax-resilient' legislatures turns out to be higher where tax revenues are reinvested in school-feeding and other public health programmes. This might also be the case for climate change mitigation for the transport sector, starting for instance with a tax on vehicles emitting excessive pollutants. On the other hand, public health policies so far unsuccessfully experimented with fat taxes (Denmark, United Kingdom). Cash-strapped Portugal envisages a salt tax for mid-2018.

Here again, not a lot emerges explicitly from the NDC so far available. Taxation for climate change mitigation could be included under any broad commitment to reduce emissions or in the promotion of green technologies, which are abundant in the NDC analysed by FAO. But it is too early to see clearer indications on how governments intend to pursue such goals.

Canada, for example, commits to taking strong action in the pursuit of a low-carbon economy, green infrastructure and clean technology. India sets the promotion of clean biomass energy as a goal. Fossil fuel subsidies in oil-producing countries are still as abundant as they are criticised by economists. Unsurprisingly, but only vaguely, Nigeria talks about reforming its petrol/diesel subsidies. While there are several ways through which these could be pursued, taxation of inputs and production practices with heavy footprints could

undoubtedly be one of them. Interestingly, Armenia proposes to create a climate change civil fund to be replenished by receipts stemming from environment fees including carbon taxing.

Climate change mitigation-related taxes can have international repercussions. As shown above for the EU's aviation ETS, this can easily raise opposition by affected countries, mainly because excise taxes applied based on the distance travelled by 'like' products could fall foul of Article III GATT. As for actual WTO case law, the rulings in *US – Foreign Sales Corporation* (DS 108) as well as for subsidies on large civil aircraft (DS 316, 317, 347 and 353) confirmed that both direct and indirect taxes remain subject to multilateral trade rules in respect of subsidies, taxes, and BAM (Daly 2005).

3 Subsidies

In a 'stick and carrot' view of regulatory action, subsidies are often an effective if not necessarily efficient climate action tool. Interestingly, not only developed countries use taxpayer contributions for various societal objectives and for farm income support purposes, some of which with a food security or even a climate mitigation component. Nowadays, many developing countries increasingly find the necessary resources for such purposes. As a result, especially so-called Amber Box support measures contribute to farm security in a way which other countries choose not to go, and which poor countries find impossible to compete with on world markets, and even at home. Coming to their defence, perhaps, are limitations established by case law referred above and below for tax breaks⁵² and for export competition instruments such as agricultural export credits.⁵³ Similarly, export state trading practices of such as export and import restrictions made effective through state-trading operations of Marketing Boards must be guided by 'commercial considerations' (GATT-Article XVII).⁵⁴

The post-Paris NDC are a very first implementation step. Action proposals and commitments are still very vague and general in scope. However, except in the NDC of developed countries which offer little beyond an emission reduction target, subsidies appear to be among the policy instruments more likely to be used throughout the sample of NDC taken into consideration. In fact, commitments to promote or mainstream some sort of sustainable practice or technology, formulated in a variety of ways and which would easily allow for subsidies of some type, are present in most NDC.

Canada, for instance, proposes to invest significantly in a low-carbon economy, green infrastructure and clean technology. China intends to make efforts to achieve zero growth of fertiliser and pesticide utilisation. Mexico wants to strengthen the diversification of sustainable agriculture. Vietnam has included the development of sustainable agriculture as a means for emission reduction.

Under a climate perspective the subsidy issue looks different from the WTO approach of non-discrimination and trade distortion avoidance. A more thorough examination of the Climate

⁵² *US – Upland Cotton* (DS 267)

⁵³ *US – Foreign Sales Corporation* (DS 108)

⁵⁴ The Decision on Export Competition taken at the Tenth Ministerial Conference in Nairobi to abolish export subsidies for farm exports may also be relevant for other export competition instruments (cf. WT/MIN(15)/45 dated 21 December 2015). It is too early, however, to gauge whether climate measures will directly or indirectly benefit, or on the contrary be impeded, by this new discipline.

Change Tool Box for Agriculture (Box 1) definitely merits consideration if trade competition with subsidies alleging climate mitigation or adaptation is to be contained. The Paris peer review process might shed some light on some of these measures. Other international organisations like the FAO, UNCTAD, or the OECD, could also contribute with their means to the identification of climate-smart policies, standards – and subsidies.

The key for an economic impact assessment of agricultural subsidies in a climate perspective would probably be the contribution of a 'differentiating' subsidy under the Paris Agreement. Here again, not everybody is equal. Some temperate climate countries may actually benefit from global warming, with little or no justification for a subsidy. Closer to the Equator, adaptation subsidies and ODA might find economic justification especially for farmers without meaningful support from their governments.

4 Consumer Information

WTO rules are to act as guardians against altering competitive conditions not only for regulating imports. WTO rules also impact on some of the simplest awareness-raising tools such as marketing and consumer information regulations. At least part of a country's citizenship is likely to be open to what economists like to call 'nudging'. Hence, the implementation of the Paris Agreement may well motivate governments to prescribe certain types of labels, for instance by indicating the footprint of a particular product. Consumers can then take their purchase decisions and yet remain free to buy their preferred product.

While nobody in the WTO questions consumer information as an objective, heated debates take place for specific labelling schemes, particularly in the TBT Committee.

So far, no 'climate label' as a tool for an agricultural policy objective has come to the forefront in these debates. Of course, nudging works differently for climate concerns than for, say, smoking, animal health, child labour, or obesity prevention. But a plethora of recent labelling schemes introduced for public health purposes are perhaps an indication of how such issues might be treated under WTO rules and procedures. Boza and Espinoza (2016) describe the 'specific trade concerns' expressed by a number of country delegates in respect of a health-related label scheme notified by the Chilean government (see Window 2 below). The compulsory marking by way of 'rotulos' for prepackaged food with high contents of calories, sodium, saturated fats and sugar was seen by other trade diplomats as 'health warnings' representing technical trade barriers hardly compatible with the TBT Agreement.⁵⁵

⁵⁵ The TBT Agreement tries to ensure that standards are genuinely useful, and not arbitrary or protectionist (Art. 2.1, 2.2 and 2.4). These measures might be governmental regulations but also private norms adopted by national and international standard-setting bodies. The Code of Good Practice for the Preparation, Adoption and Application of Standards (TBT Annex 3) is a set of procedural rules which these bodies are encouraged to follow when they elaborate their standards. However, unlike the SPS Agreement, the TBT Agreement does not refer to any specific international organisations or standards as guidance. Nonetheless, several TBT dispute settlement cases referred to such standards as an indication of a consensus on how to implement the underlying policy objective without erecting trade barriers. In this sense the TBT Agreement can be read as a useful guideline for national measures addressing the policy objective in a transparent and comprehensive way (Source, for this and for the debates on the Chilean 'rotulos': TBT Information Management System, available at <http://tbtiims.wto.org/>)

The concerns expressed did not question the scientific justification of the levels triggering the labelling obligation, following recommendations by the WHO for the control and prevention of obesity. Rather, the proposed regulation was seen as modifying conditions of competition in favour of domestic producers and to the disadvantage of global brand operators. For instance, Australia noted that the application of a mandatory health message referring to levels of specific critical nutrients was not consistent with the principle of the *Codex Alimentarius Guidelines on Nutrition Labelling* that 'the information should not lead consumers to believe that there is exact quantitative knowledge of what individuals should eat in order to maintain health, but rather to convey an understanding of the quantity of nutrients contained in the product.'

Window 2: Chile's Consumer Information Health Labels

Figura 1. Nuevo etiquetado chileno de advertencia para alimentos que superen el umbral de nutrientes críticos.



Fuente: Elaboración propia a partir de Reglamento Sanitario de los Alimentos, Decreto N° 13, 2015.

Source: Boza and Espinoza (2016)

Notwithstanding widespread criticism, at home and in the WTO, Chile adopted the measure in 2016, after numerous TBT Committee Sessions in 2013, 2014 and 2015. So far, no formal complaint has been lodged in this case. Other countries, for instance Peru, are very likely to follow this type of health policy tool. Nonetheless, this example shows that measures with international implications and markets segmentation are not an easy road. Even a somewhat 'softer' nudging tool like the 'traffic-light labels' indicating different energy efficiency of household appliances in Europe, took considerable time to gain acceptance, mainly because of non-transparent efficiency criteria. A UK Government project to introduce similar traffic lights, indicating health properties of breakfast cereals in 2018 met with considerable opposition by the European Dairy Association. And when Italy obliged food labels to indicate the name of the production factory, EU industry representatives protested.

Explicit calls for increased consumer information and awareness appear sparsely in the publicly available NDC. A good example, again without providing too much detail, is Nigeria's commitment to significantly increase public awareness and involve private sector participation.

Without opining on the general WTO-compatibility of mandatory consumer information it seems obvious that labels providing consumers with, say, footprint information might face criticism in the WTO. As shown in **Box 3**, of the only two labelling cases ever brought to the DSB, both claiming to be trade-neutral consumer information labels, the first one was still pending at the time of writing this article. The second case ended with the respondent withdrawing the incriminated regulation in order to avoid retaliation.

Box 3: Consumer Information Measures with Mixed Results

Case Number	Respondent and (Short) Title	Complainant	Current Status
DS381	<i>US — Tuna II</i>	Mexico	On 26 October 2017, the Compliance Panels found the US 2016 Tuna Measure 'calibrated' and thus, consistent with TBT-Article 2.1., and justified under GATT-Article XX. Mexico appealed this ruling.
DS384 + 386	<i>United States — Certain Country of Origin Labelling (COOL) Requirements</i>	Canada and Mexico	COOL legislation repealed on 18 December 2015.

Source: WTO Webpage https://www.wto.org/english/tratop_e/dispu_e/dispu_subjects_index_e.htm last accessed on 31 October 2017

5 Risk Management, Risk Insurance and Climate Change Adaptation

It is often stipulated that global warming and climate change bring about more, and more devastating, natural disasters. Hurricanes, typhoons and blizzards may occur with a higher intensity, more monsoon irregularities, rising sea levels due to melting glaciers and permafrost reduction. While a clear correlation is in many cases yet to be established, the main insurance and reinsurance companies are fully aware of this danger. Some have already reduced their risk exposure or increased their insurance premiums. Obviously, the not unlikely scenario of more rains falling at the wrong time and in the wrong places would impact especially on agriculture.

This is not necessarily a problem for global food security, as long as climate change beneficiary farmers can compensate the production fall-outs. Demand-side measures to reduce demand especially in developed countries for ruminant livestock products remain a major challenge though, because some producers will inevitably go out of business but hopefully find remunerative alternatives. Hence, the food security issue to be addressed both under the Paris and the WTO Agreements is how mitigation can take place at local and national levels without driving producers out of business, and prices out of an affordable range.

Responsible governments, at any rate, are re-examining their options. A variety of *risk management* instruments have been in use since many years, with public support especially for specific risks and risk management instruments. The classic example on the weather front is hail, frost and flood insurance allowing farmers to buy coverage for production losses beyond their control (Munroe 2017). Some (mainly developed) countries where prices are not fixed by the state offer insurance for many other risks as well, including disaster risks, domestic and export market price variations, drought, and bio-security. Presently, the main users appear to be the United States, China, Canada, Japan and Spain. Australia, New Zealand and The Netherlands are relatively small users, but they presently try to innovate for climate-related risks. The OECD describes some of these programmes under

its *Risk Management Programme* which also includes a number of agricultural production and marketing risks.⁵⁶ OECD (2011) describes and assesses various national schemes in use, with a view to determining the importance of the subsidy element involved in just about each of the different risks addressed. Under the same programme Kimura and Le Thi (2011) tried to measure risk exposure at the farm level and to analyse farm behaviour and policy performance under variable risk conditions. Goodwin (2012) studied the 'harm' done by insurance schemes. It has often been noted that risk management attitudes vary with increasingly adverse weather conditions (Munroe 2017). Schoengold et al (2015) showed that Iowa farmers tend to take out more disaster and crop insurance instead of resorting to risk-reducing conservation tillage.

Noteworthy among developing countries is the *Weather Based Crop Insurance Scheme* in India, an index-based **insurance programme** introduced in 2007 which according to sources quoted by Glauber (2015) included more than 9 million Indian producers in 2010–11, with a combined commercial premium volume of about USD 260 million. Joe Glauber also reports that global premium volumes are estimated to have increased at an annual rate of about 16 percent between 2004 and 2013. As shown in **Box 4** the main users also notify to the WTO increasing amounts under their various agriculture-related risk insurance programmes – and under different WTO provisions.

Box 4: Notification of agricultural insurance (selected countries, USD millions)

	US	Japan	Canada	EU	China	India	Brazil
<i>Notification</i>	<i>Amber</i>	<i>Green/ Amber</i>	<i>Amber</i>	<i>Amber</i>	<i>Not reported</i>	<i>Green</i>	<i>Green</i>
2008 - 2009	5,691	626	699	770	1,148	174	65
2009 - 2010	5,426	682	771	548	1,473	330	181
2010 - 2011	4,711	695	748	550	1,571	693	302
2011 - 2012	7,461	779	881	583	2,080	na	78
2012 - 2013	6,926	736	1,002	na	2,949	na	455
Aver.	6,043	704	820	613	1,844	399	399

Source: Glauber (2015), p.10, with WTO data as of 28 September 2015

Note: na = not applicable

An interesting scheme has been developed in drought-affected developing countries, whereby weather insurance is offered by local insurance in cooperation with meteorological institutions, NGO and international reinsurance companies. In Ethiopia, for instance, farmers unable to pay the premiums can acquire an insurance licence in public works projects in their region ('work for insurance'). (Häberli 2013)

There is no insurance scheme against all facets of climate change. However, a rapid increase in weather insurance can be anticipated. And a multiple peril agricultural insurance also

⁵⁶ For all OECD Studies in Risk Management see

<http://www.oecd.org/futures/globalprospects/oecdstudiesinriskmanagement.htm> (available on 20 October 2017)

covering long term effects of climate change might well be in the offing – at what and whose cost is another question. Perhaps surprisingly, no INDC/NDC appears to report the various weather insurance schemes in place or envisaged in both developed and developing countries. One reference is China's intention to 'improve the green credit mechanisms, to encourage and guide financial institutions to operate energy-efficiency crediting business and to issue asset securitized products for green credit assets' – without specifications on how this will be implemented.

In view of the additional and different risks climate change entails, some such instruments might well offer considerable advantages both for facilitating adaptation and for bridging repeated harvest losses. At the sometime, the economic rationale for such schemes should be studied carefully, also taking into account that poorer countries may not be able to compete here. But the question under a trade rules perspective is whether adaptation programmes, premium subsidies, or other forms of governmental help can be considered to distort trade. This is, not least, a question of the duration of the risk, and of the government support. A permanent support scheme would more likely fall into the Amber Box than punctual and time-limited production retirement and disaster relief programmes reducing the marketable production volumes. Such programmes may find coverage under the Green Box (and thus be available without a quantitative limit) provided the relevant conditions are met. For instance, there are numerous conditions for production loss insurance and income safety net programmes.⁵⁷ Similar Green Box conditions apply to compensation for production losses of at least 30% due to large disasters. Finally, it should be noted that in order to qualify as a Green Box measure (not subject to limitations or reductions) all these programmes are subject to additional conditions. In particular, they are required to be 'no or at most minimally' trade distorting.⁵⁸

Accordingly, since 2012 the perhaps largest such program, the US Crop Insurance Support Program, has been notified to the WTO as (trade-distorting) 'product-specific support.' In combination with other large farm subsidies, such risk hedging schemes may exert 'serious prejudice' to foreign producers without insurance programmes. On the other hand, in the cotton case the Panel found that crop insurance alone did not contribute to serious prejudice, since losses were based on production rather than price various US farm support programmes. This ruling was not appealed, perhaps because those other programmes were found to encourage production and exports, with the result of driving down world market prices to the disadvantage of Brazil's and other cotton producers.⁵⁹

Besides, the US Crop Insurance Support Program is related to world market price changes, not (directly) to weather risks. Joseph Glauber (2015) posits that risk management support is likely to fall into the category of trade-distorting instruments – the so-called 'Amber Box.' This does not mean they are prohibited; but the total public expenditures under all such programmes, or for a specific commodity, are limited – for all WTO Members.

⁵⁷ AoA Annex 2, paragraph 8

⁵⁸ According to Paragraph 1, domestic support measures claiming Green Box status "shall meet the fundamental requirement that they have no, or at most minimal, trade-distorting effects or effects on production."

⁵⁹ Cf. *United States — Subsidies on Upland Cotton* (DS 267); Glauber (2015) p.17

Finally, looking at climate change **adaptation** measures, the NDC analysis of the FAO shows an interesting result (Benda and Zimmermann/FAO 2018). Presently, there is hardly any mention of adaptation measures in developed country NDC, as opposed to those of developing countries where they figure extensively. This might be due to the fact that developed countries benefit broadly speaking more often of a temperate climate, while many developing countries are more likely to suffer from extreme consequences of climate change. As a consequence, within many of the analysed developing country NDC, there is scope for potential risk management measures by way of adaptation programmes.

The green credit mechanisms in China, and Armenia's proposal for a climate change civil fund with an appropriate legislative institutional framework for adequate financial assistance, have been mentioned above. In a broader manner, Egypt for instance commits to building an effective institutional system to manage climate change associated crises and disaster.

The increasing recourse to insurance, with public support, is likely to continue, including in the name of climate change. Like for subsidies, economists might also point out that disaster insurance as an adaptation tool would not be *eo ipso* climate smart if it creates incentives for farmers to stay producing in zones where production becomes less feasible, in the long term, due to climate change.

5. Conclusions: Act Carefully but Rapidly

This article tried to show which trade rules might matter for what kind of climate measures. The main criteria for a legal assessment under the multilateral trade framework of the WTO remain the positive or negative discriminatory elements of a measure, inasmuch as they modify the conditions of competition. This means that for instance, climate impact considerations would matter only for the assessment of a legal defence e.g. under GATT-Article XX. However, recent case law appears to leave more room for a holistic approach. For instance, the efficiency and effectiveness of technical regulations, e.g. in terms of carbon footprint reductions, can now taken into consideration in order to validate an exception to a rules violation. To take the example of a technical regulation, a 'legitimate regulatory distinction' is now a sufficient condition to justify e.g. a rules violation under the basic conditions of TBT-Art. 2.2.⁶⁰ As for an impact assessment of a consumer information label, both cases described in **Box 3** innovated. In *US – COOL* the Panel found that additional costs due to the measure did not have to fall equally on foreign and domestic products. In the (not yet final) compliance procedure for *US – Tuna II* the Panel clarified that a regulation 'calibrated' to the risk of non-fulfilment could meet the condition of being 'not more trade-restrictive than necessary to fulfil a legitimate objective.'

⁶⁰ 'Members shall ensure that technical regulations are not prepared, adopted or applied with a view to or with the effect of creating unnecessary obstacles to international trade. For this purpose, technical regulations shall not be more trade-restrictive than necessary to fulfil a legitimate objective, taking account of the risks non-fulfilment would create. Such legitimate objectives are, *inter alia*: national security requirements; the prevention of deceptive practices; protection of human health or safety, animal or plant life or health, or the environment. In assessing such risks, relevant elements of consideration are, *inter alia*: available scientific and technical information, related processing technology or intended end-uses of products.'

Despite these new developments in adjudication, the ground rules remain unchanged. WTO dispute settlement still serves to preserve the WTO rights and obligations of Members.⁶¹ It has been argued that no WTO ruling has ever contributed to a violation of human rights violations, and that 'pragmatic solutions' were found for access to medicines and blood diamonds (Petersmann 2009:76). Gabrielle Marceau (2006) consistently emphasises that a good faith interpretation of WTO rules will in many cases allow for a 'coherent reading' with human rights.

Absent a valid exception (i.e. an interpretation by the General Council, an amendment, or a time-limited waiver), many measures claiming to implement the Paris commitments may appear problematic under the present trade rules. Any country feeling discriminated against can instigate dispute settlement procedures. And if a rules violation is established, the adjudicator (Panel or AB) has to issue a ruling which will be endorsed by the DSB, calling upon the respondent to comply. In the (rare) cases of non-compliance, the complainant has the right to 'retaliate' by withdrawing a concession of substantially equal value to its trade losses.

Other climate-related issues such as the renewable energy disputes listed in **Box 2** show an emerging case law applying the trade rules in 'splendid isolation' – mostly without admitting WTO exceptions as a valid defence. Despite having the duty, recognised by the AB, to examine violation claims, and defences, other than under WTO Law, no adjudicator has ever found peremptory public international law (*ius cogens*) to overrule WTO Law. The lack of specific and clearly climate-related obligations, or mandatory international standards in multilateral environmental agreements, including the Paris Agreement, makes the case of a respondent invoking such provisions very difficult.

For agriculture, specific climate-related measures are yet to be notified to the WTO. There is no directly relevant case law. Moreover, climate-smart agricultural standards and practices are still to be developed at the international level. The available INDC and NDC provide little more than a number of possible avenues where developing and developed countries declare their intention to reduce GHG production along the food value chain. The Paris process should thus be seen both as a challenge and an opportunity for policy-makers, as well as for national and international standard development, and for shaping producer and consumer behaviour.

Our overview shows that the agricultural chapters in the already available NDC do contain a few pathways and objectives (let alone notifications of climate-related policy reforms to the WTO), albeit only a few concrete examples of actual GHG reduction measures. It is therefore neither appropriate nor possible to reach a general assessment of these measures under a trade rules perspective. Nevertheless, the agricultural NDC chapters are considered as essential components informing the 'Climate Change Toolbox for Agriculture' containing

⁶¹ Art. 3.2 (emphasis added): 'The dispute settlement system of the WTO is a central element in providing security and predictability to the multilateral trading system. The Members recognize that it serves to *preserve the rights and obligations of Members under the covered agreements*, and to clarify the existing provisions of those agreements *in accordance with customary rules of interpretation of public international law*. Recommendations and rulings of the DSB cannot add to or diminish the rights and obligations provided in the covered agreements.'

many national measures for climate change mitigation (Box 1). They also indicate, at a very general level, some of the issues possibly arising in an agricultural trade and investment context.

Without a complainant there is no judge, and no ruling. Legal opinions in respect of trade issues, even case law, cannot predict failure of a specific climate-smart agricultural policy measure, nor are they a safe conduit ensuring success in case of a dispute.

The 'Climate vs WTO Challenge' is to provide legal security for the implementation of the Paris Agreement. Maximum policy space for climate mitigation and adaptation is of utmost importance. At the same time, national measures should not negatively impact on other countries, or unduly restrict trade and investment, especially in poor developing countries. The crucial question for the examination of all relevant WTO rules proposed here is which tools in the climate change toolbox might be those with the least trade frictions, and which tools might require clarifications, interpretations, amendments or waivers.

Clearly, there are WTO un-problematic policy areas and measures. Secondly, there is no problem with self-discrimination i.e. obligations imposed on national producers only, without BAM applying similar footprint requirements to foreign suppliers – as long as the usually accompanying financial compensations do not unduly impair trade or displace imports. And, thirdly, all WTO agreements contain general as well as development-specific flexibilities, even though none seems to allow the type of *differentiation* between otherwise 'like' products and services implicitly mandated by Paris.

This development dimension appears as another blind spot under the multilateral trade rules. Rich countries and those with small farming sectors obviously are in a different position in their choice than poor countries, especially those with a high relative footprint in terms of output units, as is often the case for small and subsistence farmers, nomads, and fishermen. Put simply, a draft animal produces more methane than a tractor. The same goes for a suckling cow compared with a hyper-performing animal, in terms of meat and milk output per unit of methane (CH₄). Unfortunately, while the Paris Agreement obliges all countries to take the development dimension into account when formulating their NDC, it does not indicate which policy tools are really climate-smart or development-friendly, or both.

This leaves the trade community with a task it has not yet started to seriously examine, let alone negotiate. True, there are a number of exceptions to all general and specific trade rules. They are regularly used in litigation, including GATT-Article XX for environment and natural resource protection, health, and public morals, Article XXI for national security, and Article XVIII for infant industry protection. The official description of all SDT provisions reflecting WTO development concerns and flexibilities took 130 pages back in 2001. However, this article posits that, generally speaking, these provisions and defences may be good for preventing trade distortions, or improving developing country market access, or alleviate structural adjustment pains – but they do not allow for permanently 'differentiated' climate change mitigation and adaptation.

What can be done? For instance, should a 'Paris waiver' be added to the list of measures in GATT-Article XX? And, provided such a mile change is feasible, would the very restrictive 'chapeau' of that article leave sufficient policy space for at least those measures which are

devoid of major trade distortions? Are the SDT provisions in the relevant WTO agreements sufficient to give poor developing countries, and their large emitters, adequate farm support tools, and effective market access for their climate-smart export products?

This article can only show the potential problems of some of the envisaged measures. At this stage of NDC development, trade problems are theoretically possible for three main types of measures:

- 1 Support for only national producers embracing GHG reducing production when such subsidies not only compensate for the disadvantage vis-à-vis other national producers but also enhancing export competition or import displacement.
- 2 Border measures for only climate-'unfriendly' products and production methods, whether or not they increase WTO-agreed tariff maxima.
- 3 Consumer information schemes like government-regulated labels indicating product footprint.

So far, the WTO comitology has failed to address such problems in any detail. Besides, some of these problems would also appear to call for a similar reflection in respect of international investment treaties, regional trade agreements, and sectorial agreements on energy, aviation, water management, shipping, fishing and migration. In addition, in order to fulfil the Paris-enshrined Development Dimension, various types of preferential treatment for climate-friendly products and processing methods from developing countries would also have to be re-evaluated.

Pending a serious exercise of reflection by the trading community, in association with the national and international climate change stakeholders, it is difficult to propose solutions in concrete terms. Nevertheless, it is hoped that this article may contribute to ending the affirmation by politicians and diplomats, up and including at the COP21 meeting in Paris, that environment and trade policies are *eo ipso* 'mutually supportive'. The both ambitious and urgent reflection (and possibly negotiation) proposed here would allow to identify policy areas and measures

- 1 where quick solutions for possible conflicts might be available
- 2 where a review of trade rules (or waivers thereof) and available international standards might be necessary
- 3 with some early indications of how this could be done: inter-institutional cooperation and procedures, academic support, and interagency government delegations' involvement at the international level.

This article concludes with a tentative list of WTO rules where minimally trade-impacting adjustments might be considered (i) applying to all countries or (ii) exclusively to poor developing countries (Box 5). This list is not a carte blanche for climate action by any means. For instance, a carbon tax might be less climate-smart, yet more trade-restrictive, than a subsidised sequestration programme. Similarly, the present boom in risk insurance schemes with government support may have adverse effects on judicious risk taking by operators, without additional benefits for more climate mitigation or food security. Nonetheless, WTO would be ill-placed to refuse a debate on the climate tool list, and on the suggested rules review, just for its own dogmatic reasons. The last three Ministerial Conferences almost

failed because the food stockpile issue was not dealt with seriously and with an understanding of the different interests at stake (Galtier 2017).⁶² Now is perhaps the time for a new effort to look beyond trade and economic but non-sustainable growth.

As for the development dimension, extreme care is warranted in addressing this issue, knowing that all GHG emissions have global, not merely national, effects. For instance, it can be argued that to exclude middle-income and large developing countries may be justifiable on the basis of the need to contain the potential proliferation of trade distortions due to climate policies (in addition to any other considerations, e.g., equity). On the other hand, inaction by large GHG emitters (at any level of development) can have a very serious impact on global warming. These considerations would seem to indicate a need for extreme caution, and possibly an ad hoc approach with different thresholds, for each climate-motivated exception to the trade rules.

This is not a work programme. But considering that up to nineteen agreements and other texts might be concerned by the 'Climate vs WTO Challenge', and that the Paris/NDC process requires a rapid development of mitigation and adaptation measures, it seems obvious that work in the WTO constituency and beyond should start as soon as possible. However, some key issues identified in this article also require progress in the climate fora (COP) and on the development side (SDG). Intergovernmental work, in parallel and on all fronts, could lead to a trade- and development-friendly framework for the elaboration of climate-smart policies under the Paris Agreement. On 14 November 2017 the COP23 decided to 'address issues related to agriculture, [...] taking into consideration the vulnerabilities of agriculture to climate change and approaches to addressing food security.' (UNFCCC/IPCC 2017) This (draft) decision would seem to indicate an acknowledgement that turning a blind eye to this sector which is key for food security and for development, is no longer possible. If countries are to move forward with the implementation of policies that are both effective in achieving climate change mitigation and adaptation, while at the same time meeting other international objectives (i.e. a level-playing field for trade, and SDG fulfilment) this will need to be addressed without further ado.

Climate change is likely to affect agricultural production, as we today know it, even more than other sectors. And small producers in poor developing countries – in fact, the majority of the world's farmers – may well be among those facing the biggest problems in the absence of efficient, effective, and climate- and trade-friendly solutions.

Box 5: WTO Rules and Possibly Necessary Adjustments Allowing for Trade-Friendly Climate Action

Adjustments to be considered "without more than a minimal trade impact"		
WTO		
Texts (in alphabetical order)	➤ for all WTO Members	➤ only for poor developing countries and measures

⁶² Franck Galtier analyses what he calls the 'biases in current WTO rules for estimating the support provided to farmers through public stockholding programmes' and proposes to correct these biases by the 'right metrics on the support provided to farmers through public stockholding programmes', both under the AoA and the SCM.

AoA	Annex 2 ('Green Box'): to add a paragraph 14 allowing for efficient and effective climate mitigation support measures based on internationally recognised standards (e.g. best agricultural practices), at levels with no more than a minimal impact on trade and production.	Art. 6.2 (Developing Country Green Box) to be generally and permanently available for clearly climate-friendly investments and risk management, such as for drought management, flood control, and soil management, including certain credit schemes and subsidies e.g. for irrigation construction, and certain agricultural input subsidies for low-income or resource-poor producers.
ADP	Anti-dumping disallowed for internationally recognised climate-smart action as long as a subsidy or other incentives to a given product from a particular exporting country do not over-compensate the additional production costs due to the climate-smart action at issue. Anti-dumping is also disallowed where the importing country applies an equivalent climate-smart measure. (Art. 3.5 for causation analysis)	
DSU	Adjudicators to consider context and customary international law (as per Art. 31 VCLT) and not to rule out Paris Agreement implementation measures where the underlying climate change mitigation objective cannot be attained otherwise than with a minimal trade distortion.	
GATT	<ol style="list-style-type: none"> 1. No WTO rules shall be construed to prevent the adoption or enforcement of measures necessary for implementing the Paris Agreement (e.g. for the internalisation of GHG reduction costs). WTO Members shall benefit from a new provision in GATT-Article XX (lit. k), <i>mutatis mutandis</i> subject to the provisions in the chapeau of Article XX, and taking into consideration the above-suggested DSU modification (establishing 'necessity'). The main rules for which such an exception might be needed are found in Articles I, III:2 and III:4 of the GATT 1994; GATT-Article XXIII (non-violation') might also need to be reviewed.⁶³ 2. GHG emission pricing schemes and 'other duties or charges' levied on 	Reintroduce clearly defined infant industry protection for climate-friendly start-ups in poor developing countries (Art. XVIII GATT).

⁶³ A 'non-violation' scenario could be imagined for a Paris-related measure with only an indirect trade impact, and without an infringement of WTO Law. The so-called 'non-violation claim' provision in GATT-Article XXIII allows an adjudicator to outlaw (and to authorise retaliation against) even a measure not found to be formally violating any WTO rules and commitments. The respondent, in such a case, would then have to revise the incriminated measure and grant full market access to the foreign good or service. Whether any measure in the 'Climate Tool Box' would fulfill the criteria is doubtful. But, given the dearth of case law for this provision, such a scenario is at any rate rather unlikely.

	non-climate-smart imports may exceed scheduled tariff rates (Art. II:1(b) GATT).	
GATS	<ol style="list-style-type: none"> 1. Foreign agricultural service suppliers, for instance the so-called 'services incidental to agriculture' (CPC 881), may invoke their MFN and (scheduled) NT rights under Articles II and XVII only if their climate-impacting performance is at least equivalent to that required from domestic service suppliers. 2. Same condition to apply <i>mutatis mutandis</i> to claims in respect of scheduled commitments by individual members in specific sectors e.g. for market access restrictions based on the total value of service transactions or assets. 3. Article XIV (General Exceptions) to be modified like Article XX GATT. 	Review the (generally low) specific services commitments offered to poor developing countries under GATS-Articles XVI – XVIII.
GPA	Entities covered by this Agreement may apply internationally recognised climate standards and best agricultural practices for products or services procurement (e.g. equivalent footprint requirements).	For climate-friendly products and services procurement, Article V (Special and Differential Treatment for Developing Countries) shall be available for poor developing countries only.
LIC	Import approvals and controls for climate-related regulations based on international standards and best agricultural practices to be 'automatic' import licenses i.e. assumed not to have trade restrictive effects (Art. 2).	
NFIDC Decision		Negative effects of climate adjustment measures on NFIDC trade entities affected developing countries to compensatory support by countries implementing such climate measures.
PSI		Import controls by way of pre-shipment inspection of climate-friendly goods and services to be facilitated with the support of the importing country.
RoO	Pending the long-term harmonisation of non-preferential rules of origin, the rules of origin for environmental goods and services should be based on a positive standard (rather than stating what does not confer origin).	
Safeguards	Clearly climate-related prudential carve-outs e.g. for financial services to be shielded from safeguard complaints.	Review the justification for developing country rights to extend the period of application of a climate-related safeguard measure for a period of (presently) only two years beyond the normal maximum.
GATT Tariff Schedules	Principal suppliers and suppliers with substantial trade interests to favourably consider requests for bound tariff increases for climate-sensitive goods (and other duties and charges applying to 'like'	

	products), and proposals for substantially equivalent concessions initially negotiated with the applicant Member under Article XXVIII GATT.	
SCM	<ol style="list-style-type: none"> 1. Agricultural subsidies and other incentives provided in the context of the Paris Agreement implementation shall be assumed, under the SCM Agreement, to not have 'adverse effects' on other WTO Members as long as they are clearly based on internationally recognised standards (e.g. best agricultural practices). 2. Consumer subsidies and import substitution subsidies for climate-friendly products could be challenged as actionable subsidies under the SCM Agreement (and countervailed if there are exports) only if they involve trade restrictions (Sykes 2015). 3. Fisheries (and shipping) subsidy rules may require specific adjustments. <p>[Consider Art. 15.5 for causation analysis]</p>	<ol style="list-style-type: none"> 1. Measures taken to implement the Technology Mechanism under the Paris Agreement (Art. 9) to be considered SCM-compatible. 2. Climate-exposed small fishermen and aquaculture in poor countries to benefit similarly to production support under Article 6.2 AoA.
SPS	WHO recommendations for climate-smart health policies to be considered SPS-compatible similarly to the standards laid down for agricultural trade by the <i>Codex alimentarius</i> , IPPC and OIE (Art. 3.4 and Annex A para 3 SPS).	
TBT	<p>Provided treatment is granted to foreign products no less favourable than that accorded to like products of national origin and to like products originating in any other country:</p> <ol style="list-style-type: none"> 1. Climate-related conformity assessment procedures, and requirements for quantification and reporting of greenhouse gas emissions and reductions based e.g. on relevant ISO standards, to be assumed to fulfil a legitimate objective in the sense of Article 2.2 TBT. 2. Labelling of climate-sensitive products and best agricultural practices to be assumed to fulfil a legitimate objective in the sense of Article 2.2 TBT. 	
TRIMS		Poor developing countries to benefit from a time-limited right to restrict trade, by way of a local content requirement, as an incentive for climate-friendly investment promotion.
TRIPS		Measures taken to implement the <i>Technology Transfer Mechanism</i> under the Paris Agreement (Art. 10) to be considered TRIPS-compatible.
TFA	Disciplines e.g. for enhanced controls or inspections (Art. 5.1) to apply to 'Paris' implementation measures.	

VAL	Provisions relevant to developing countries and relating to minimum values and importations by sole agents, sole distributors and sole dealers to also apply to product differentiation necessary for the Paris Agreement implementation.
-----	---

Source: Häberli (2016), here adjusted for NDC analysis

Literature

Bartels, Lorand (2012), The WTO Legality of the Application of the EU's Emission Trading System to Aviation. 23(2) *EJIL* 429-467

Benda, Julian and Zimmermann, Andrea (forthcoming 2018): Factsheet on agriculture and the NDCs. FAO, Rome.

Boza, Sofia, and Espinoza, Macarena, La regulación chilena sobre etiquetado y publicidad de los alimentos como instrumento contra la obesidad. Online edition, 17/8 *Puentes*, 16 November 2016, Santiago de Chile

Brandi, Clara (2017), Trade Elements in Countries' Climate Contributions under the Paris Agreement. Geneva: International Centre for Trade and Sustainable Development (ICTSD)

Carbon Trust, Global Carbon Mechanisms: Emerging lessons and implications. London, March 2009. Downloaded on 1 August 2017 at <https://www.carbontrust.com/resources/reports/advice/global-carbon-mechanisms/>

Daly, Michael, The WTO and Direct Taxation. WTO Discussion Paper Nr.9. WTO, Geneva (2005)

De Bièvre, Dirk, Espa, Ilaria, and Poletti, Arlo (2017), No iceberg in sight: on the absence of WTO disputes challenging fossil fuel subsidies. in *Int Environ Agreements* published online 24 March 2017 (Springer, DOI 10.1007/s10784-017-9362-0)

Francis, Norton, Marron, Donald and Rueben, Kim (6 December 2016), The Pros and Cons of Taxing Sweetened Beverages Based on Sugar Content. Urban Institute Research Report. Electronic copy available on 20 October 2017 at <https://ssrn.com/abstract=2947716>

Frank, Stefan *et al* (2017), Reducing greenhouse gas emissions in agriculture without compromising food security? 12 *Environ. Res. Lett.* 105004

Galtier, Franck (2017), Looking for a Permanent Solution on Public Stockholding Programmes at the WTO: Getting the Right Metrics on the Support Provided. E15Initiative. Geneva: International Centre for Trade and Sustainable Development (ICTSD) and World Economic Forum. www.e15initiative.org/

Glauber, Joseph W., Agricultural Insurance and the World Trade Organization. IFPRI Discussion Paper 01473, Washington D.C., October 2015

Goodwin, Barry K. and Smith, Vincent H. (2012), What Harm Is Done by Subsidizing Crop Insurance? 95(2) *Amer. J. Agr. Econ.* 489–497

Häberli, Christian (2013), Ethiopia's Food Reserve Policies and Practice. NCCR Trade Regulation Working Paper 2013/02, available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2369703

Häberli, Christian (2014), *Seals and the Need for more Deference to Vienna by WTO Adjudicators*. Fourth Biennial Global Conference of the Society of International Economic Law (SIEL WP No 2014/22, Berne, 10 – 12 July 2014)

Häberli, Christian (2016), *WTO Rules Can Prevent Climate Change Mitigation for Agriculture*. Fifth Biennial Global Conference of the Society of International Economic Law: International Economic Law in a Diverse World? (http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2800011) (SIEL WP No. 2016/06, Johannesburg, 7-9 July 2016)

Häberli, Christian (2017a), *Adaptation of Agricultural Trade and Investment Rules to Climate Change*. in Mary Jane Angelo and Anél du Plessis (Eds.), *Research Handbook on Climate Change and Agriculture Law*. Chapter 10 at pp. 274-314. Edward Elgar, Cheltenham/UK and Northampton/US

Häberli, Christian (2017b), *International Economic Law Might Improve Water Governance in Peru*. in *El derecho humano al agua, el derecho de las inversiones y el derecho administrativo*. Cuartas Jornadas de Derecho de Aguas. Armando Guevara Gil, Patricia Urteaga y Frida Segura (Eds). Pontificia Universidad Católica del Perú. pp.265-287

Holzer, Kateryna (2014), *Carbon-related Border Adjustment and WTO Law*. Edward Elgar, Cheltenham (UK) and Northampton MA (USA)

Kang, Sungjin, *Carbon Border Tax Adjustment (CBTA) from WTO point of view*. Working Paper No. 2010/08. SIEL Online Proceedings (downloaded on 1 December 2017 at <http://www.ssrn.com/link/SIEL-2010-Barcelona-Conference.html>)

Kimura, S. and C. Le Thi (2011), *Farm Level Analysis of Risk and Risk Management Strategies and Policies: Technical Note*. OECD Food, Agriculture and Fisheries Working Papers, No. 48, OECD Publishing

Kortum, Samuel, and David A. Weisbach (2016), *Border Adjustments for Carbon Emissions: Basic Concepts and Design*. Discussion Paper No. 16-09. Washington, DC: Resources for the Future

Marceau, Gabrielle (2006), *The WTO Dispute Settlement and Human Rights* in F. M. Abbott, Ch. Breining-Kaufmann, and T. Cottier (eds.), *International Trade and Human Rights: Foundations and Conceptual Issues* (Ann Arbor: University of Michigan Press)

Meltzer, Joshua (2012), *Climate Change and Trade: The EU Aviation Directive and the WTO*. 15(1) *J Int'l Econ L* 111

Laura Munroe (OECD) (2017), *Insurance Structure, Risk Sharing, and Investment Decisions: An Empirical Investigation of the Implications of Individual and Group Weather Index Insurance*. IFPRI Discussion Paper 1642

OECD, *Managing Risk in Agriculture, Policy Assessment and Design* (2011). OECD Publishing, Paris

Petersmann, Ernst-Ulrich (2009), *International Trade Law, Human Rights and the Customary International Law Rules on Treaty Interpretation*. in Joseph (ed.), *The World Trade Organization and Human Rights. Interdisciplinary Perspectives* (Cheltenham: Edward Elgar)

Rajamani, Lavanya (2016), *Ambition and Differentiation in the 2015 Paris Agreement: Interpretative Possibilities and Underlying Politics*. 65/02 *International and Comparative Law Quarterly* 493 – 514

Schoengold, Karina, Ding, Ya and Headlee, Russell (April 2015), *The Impact of AD HOC Disaster and Crop Insurance Programs on the Use of Risk-Reducing Conservation Tillage Practices*, 97(3) *American Journal of Agricultural Economics* 897–919

Smith P., M. Bustamante, H. Ahammad, H. Clark, H. Dong, E.A. Elsiddig, H. Haberl, R. Harper, J. House, M. Jafari, O. Masera, C. Mbow, N.H. Ravindranath, C.W. Rice, C. Robledo Abad, A. Romanovskaya, F. Sperling, and F. Tubiello, 2014: Agriculture, Forestry and Other Land Use (AFOLU). In: *Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Edenhofer, O., R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, A. Adler, I. Baum, S. Brunner, P. Eickemeier, B. Kriemann, J. Savolainen, S. Schlömer, C. von Stechow, T. Zwickel and J.C. Minx (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

Sykes, Alan O. (2015), The Limited Economic Case for Subsidies Regulation. ICTSD and World Economic Forum, Geneva

UNFCCC/IPCC, Draft Decision on Issues relating to agriculture. Document FCCC/SBSTA/2017/L.24/Add.1 dated 14 November 2017

Van Damme, Isabelle (2009), Treaty Interpretation by the WTO Appellate Body. Oxford University Press.